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EXCAVATING ENGINEER

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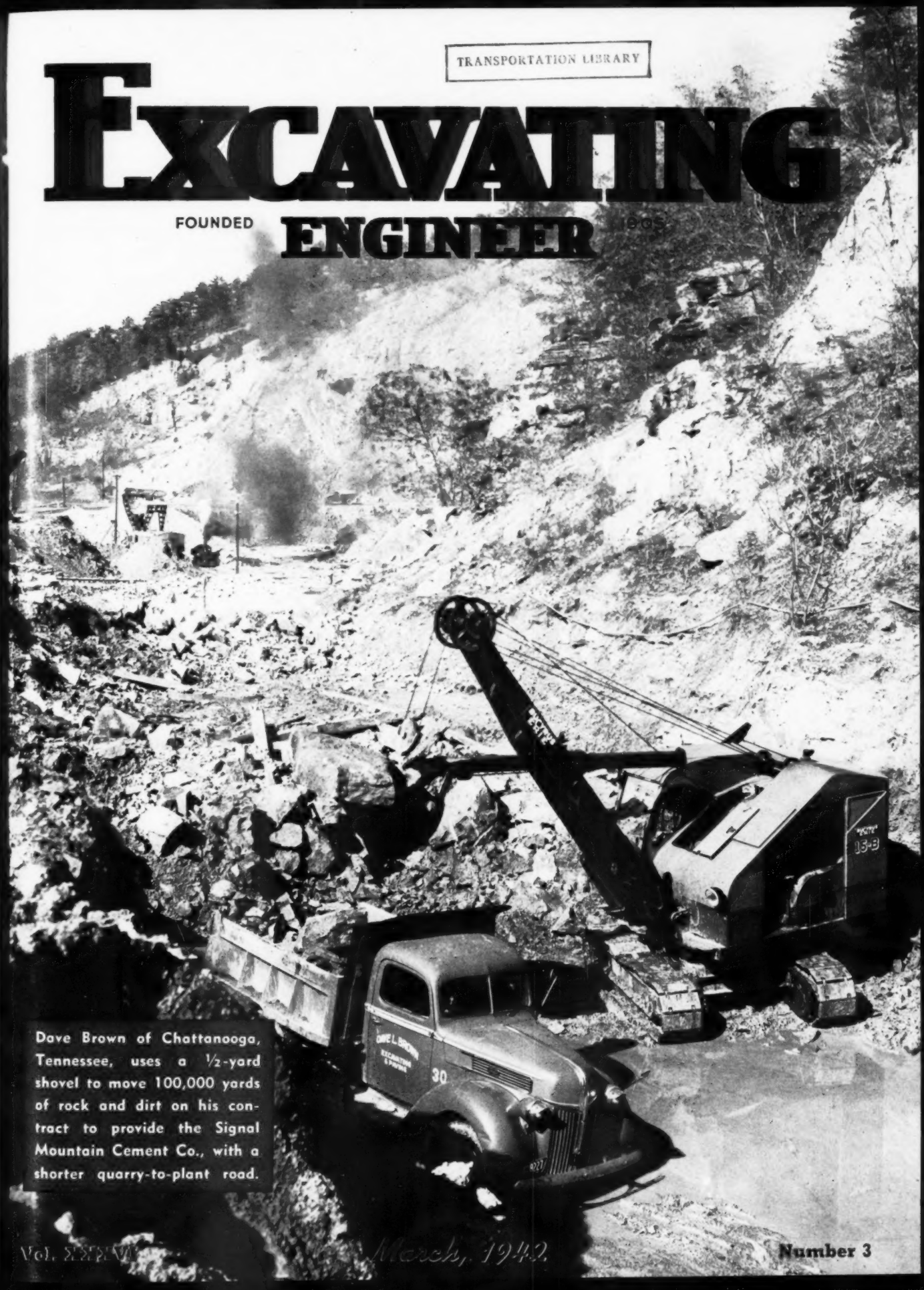

Dave Brown of Chattanooga, Tennessee, uses a ½-yard shovel to move 100,000 yards of rock and dirt on his contract to provide the Signal Mountain Cement Co., with a shorter quarry-to-plant road.

Vol. XXXVI March, 1942 Number 3

The Big Ones Come Easy

with

BUCYRUS ERIE

FIVE-YARD

120-B

1 ACCURATELY CONTROLLED POWER . . . Ample power under perfect control on each motion, hoist, swing and crowd, gives the 120-B a fast cycle. Torques, speeds and weight placement are scientifically balanced for high-speed digging. Responsive control makes it easy to maintain speed for big output throughout the shift.

2 LOW OPERATING COSTS . . . Balanced design blends operating reactions smoothly, resulting in minimum stress on machine. Every part has an ample safety factor, but modern design avoids excess weight and keeps power consumption at a minimum. With the 120-B you have minimum upkeep and minimum lost time because of time-tested design and Bucyrus-Erie quality construction.

3 EFFICIENT DIGGING ACTION . . . Long effective upper boom section, big sheaves and single-part hoist give a wide angle between line of bail pull and line of backward thrust that means maximum effective digging force at the dipper teeth. Power is applied efficiently to the business of digging throughout the 120-B.

4 BIG OPERATING RANGE . . . The 120-B has long range and high lift that make it possible to handle wide cuts efficiently. This means minimum time spent shifting tracks or shovel, and means efficient loading into modern cars or trucks. Moves, digs, and loads on steep grades; easy to get in and out of cuts.

5 FAST FULL SWING . . . Twin vertical swing units, properly balanced, give smooth action, with quick acceleration and deceleration. Full revolving, the 120-B sets oversize rocks aside easily, loads out slides quickly. With ability to load on either side, it is easy to save time by double spotting on truck haul.

6 COMPLETE MOBILITY . . . The 120-B mounting is rugged and flexible. It is a firm foundation for digging and provides for quick move-ups and fast moves from slides. The 120-B can climb stiff grades, dig in or out of a cut in either direction, go anywhere in the pit in a hurry. Ideal for mixing rock or ore; saves by doubling on loading and stripping operations.

7 EASY CONVERTIBILITY . . . The 120-B can be easily and quickly converted from shovel to dragline, or vice versa, in the field. This increases its potential usefulness, as well as giving it a higher resale value.

Bucyrus-Erie Company

SOUTH MILWAUKEE • WISCONSIN • U. S. A

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EXCAVATING ENGINEER

FOUNDED 1905

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THE ENSIGN-BICKFORD COMPANY • SIMSBURY, CONN.

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PB-42

PRIMACORD-BICKFORD DETONATING FUSE

For your convenience in writing to The Ensign Bickford Co., you will find a card bound in this issue.

Short work for a BUCKEYE!

HERE'S a step by step picture of Ray Kebbe's Diesel-powered Cletrac and Buckeye Bulldozer smashing through on a highway relocation job in Michigan with 'skinner Tony Dertz at the controls.

Buckeye Bulldozers make short work of jobs like this. They're built to take a beating and they're lightning-fast with Buckeye fingertip cable control that gives you power to spare on the heavy lifts! In dirt moving, Buckeye blades dig their own way and *roll* the dirt ahead for bigger payloads every time. Buckeye engineered balance means full traction behind the load and less wear and tear on the tractor. And the new Buckeye UNI-TILT design gives you *interchangeable* blades plus a patented tilting action that's adjusted by a twist of the wrist.

Plan now to put Buckeye 'Dozers on your machines. Ask for complete details.

THE BUCKEYE TRACTION DITCHER CO.
FINDLAY • OHIO

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Convertible Shovels

Trenchers

Tractor Equipment

R-B Finegraders

Road Wideners

Spreaders

KEEPING THE NATI

Coping with everything from an earthquake to the everyday business of removing water choking vegetation from canals, keeps the Imperial Irrigation District's modern equipment busy on a large scale as it brings life giving water to a 600,000 acre garden

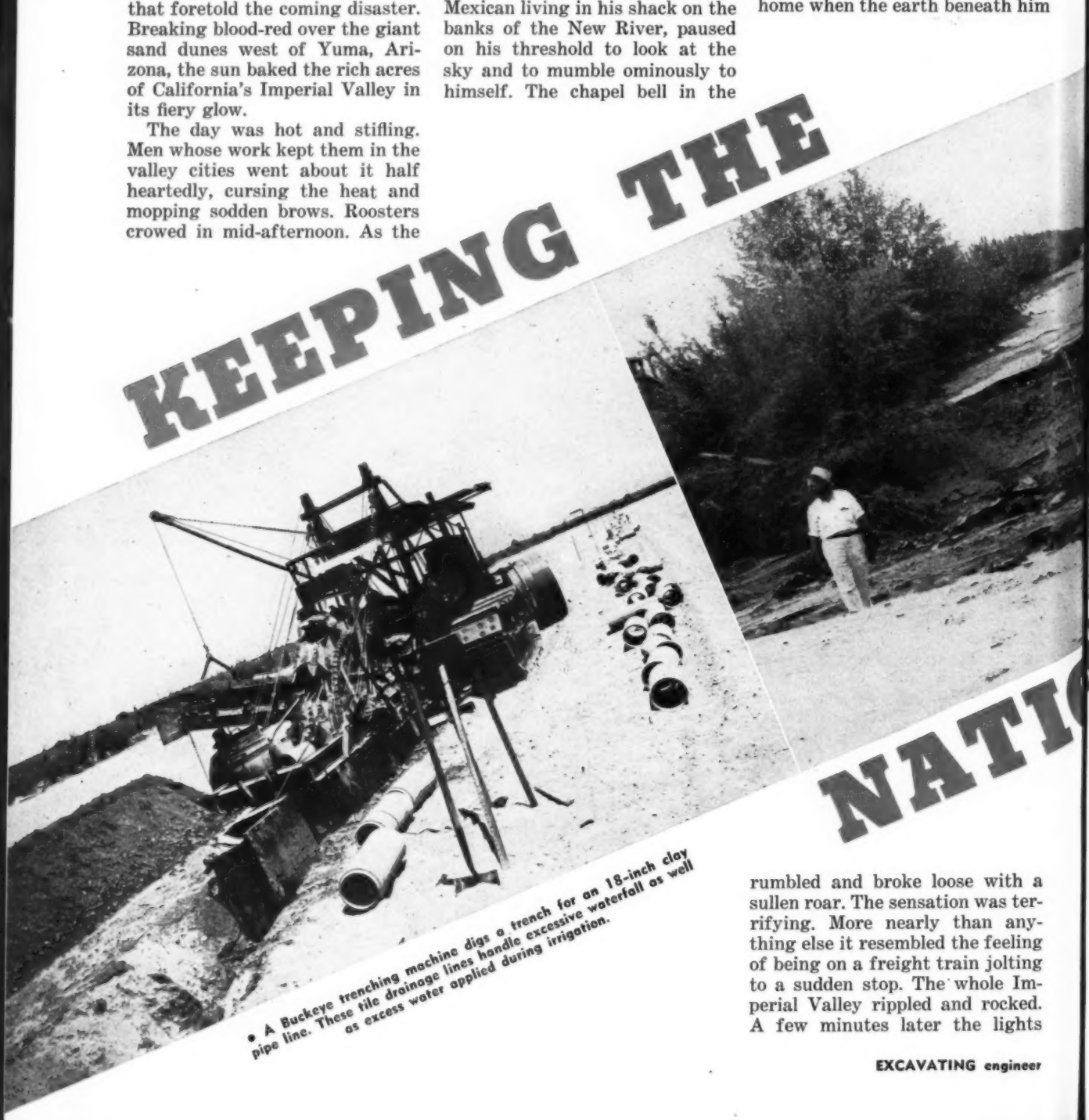
By FLOYD SUTER BIXBY

SOMETHING FATEFUL was in the air the morning of May 18, 1940; something that foretold the coming disaster. Breaking blood-red over the giant sand dunes west of Yuma, Arizona, the sun baked the rich acres of California's Imperial Valley in its fiery glow.

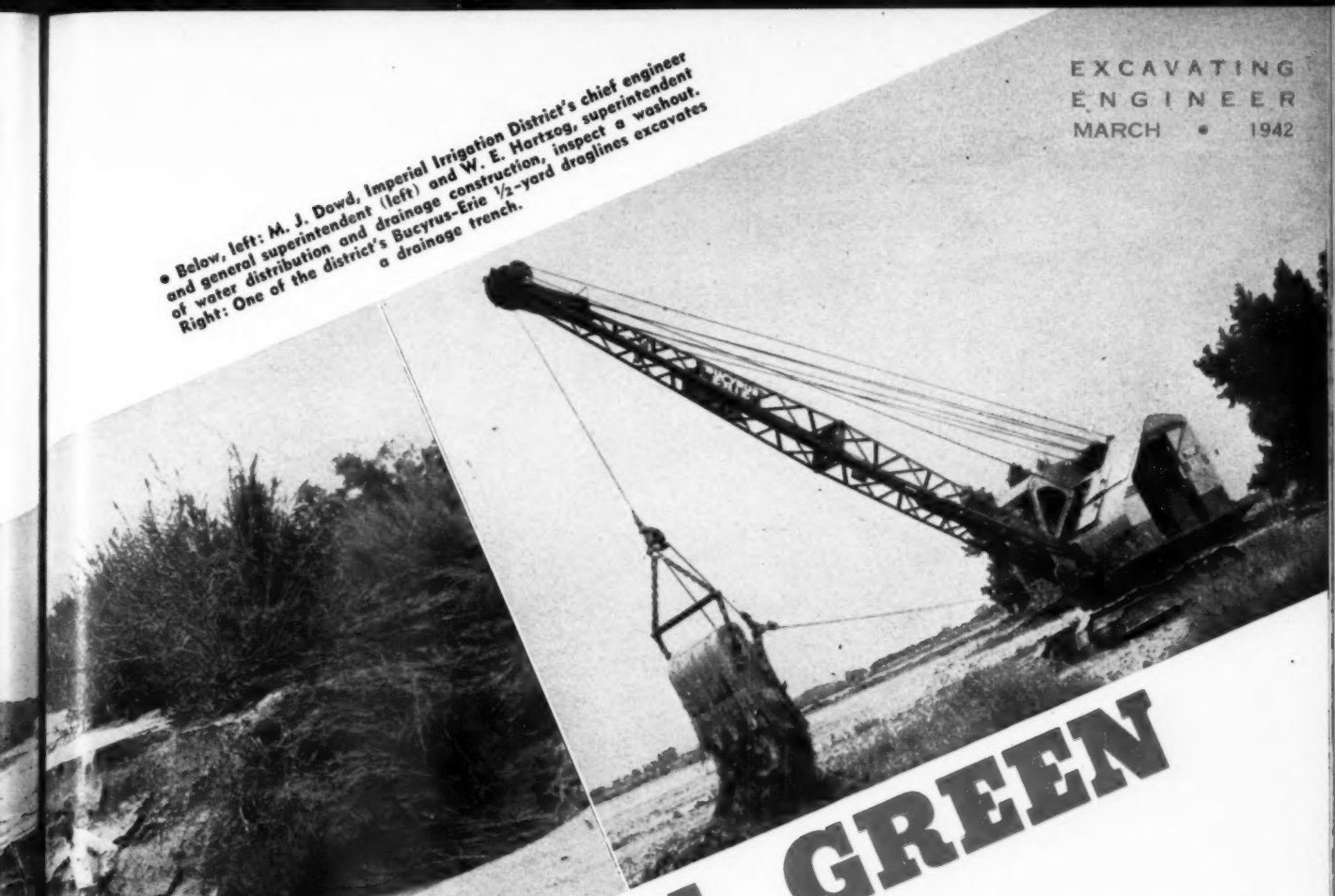
The day was hot and stifling. Men whose work kept them in the valley cities went about it half heartedly, cursing the heat and mopping sodden brows. Roosters crowed in mid-afternoon. As the day waned, a faint red haze spread like a bloody hand across the horizon. Jesus Ramirez, an ancient Mexican living in his shack on the banks of the New River, paused on his threshold to look at the sky and to mumble ominously to himself. The chapel bell in the village tolled the Angelus, and long after the echoes ceased to reverberate across the desert Jesus' mongrel cur howled mournfully into the setting sun.

"Diablo!" the old Mexican muttered over his supper of frijoles. "It is the work of the devil!"

W. E. Hartzog, superintendent of water distribution and drainage construction for the Imperial Irrigation District, had just settled in an easy chair at his El Centro home when the earth beneath him rumbled and broke loose with a sullen roar. The sensation was terrifying. More nearly than anything else it resembled the feeling of being on a freight train jolting to a sudden stop. The whole Imperial Valley rippled and rocked. A few minutes later the lights



• A Buckeye trenching machine digs a trench for an 18-inch clay pipe line. These tile drainage lines handle excessive waterfall as well as excess water applied during irrigation.



• Below, left: M. J. Dowd, Imperial Irrigation District's chief engineer and general superintendent (left) and W. E. Hartzog, superintendent of water distribution and drainage construction, inspect a washout. Right: One of the district's Bucyrus-Erie ½-yard draglines excavates a drainage trench.

'S GARDEN GREEN

went out. At the California Institute of Technology, 250 miles away, the seismograph needle was jarred completely off its center mounting pin by the force of the quake.

Making certain that none of his family was injured, Superintendent Hartzog drove like mad to his office in Imperial, seven miles away. M. J. Dowd, chief engineer and general superintendent of the district, was there ahead of him.

"Hello, Elmer," said Dowd. "Everybody all right over at your place?"

"Everybody's scared half to death, but nobody's hurt. Any reports in yet on damage to the canals?"

"None yet," replied Dowd nervously. "It may be daylight before we get any idea what this has done. But we're probably in for trouble."

"Yes," agreed Hartzog, "you're right, more than likely. I've got shovels, draglines and tractors up in the Salton Sea country now. I believe I'll get them all started toward the highways where they can be picked up by trailer. Then we can move them where they're needed."

Miles of Canals are Destroyed

As the slow hours crept by, reports began to trickle in from farmers in the valley. Long before night had changed to dawn, Dowd knew there laid ahead of the men of the Imperial Irrigation District a gigantic task of reconstruction. In the tranquil stillness of early dawn Dowd and Hartzog started out to make a survey of damage on their canal system. Their worst fears were justified. From the base of the Cocopah Mountains in northern Mexico and on up to the international boundary and beyond, the main canal feeding water from the Colorado River into the valley was broken open for 80 miles. Fifteen miles of this was gutted wide open; levees shaken down; and the precious water was running out to flood unproductive lowlands.

In those first few horrible hours Dowd thought of quite a few things: the nightly exodus of trucks rumbling northward with tons of fresh vegetables for the food marts of Los Angeles and San Diego; the city dwellers who were dependent on those vegetables; the inhabitants of the valley, his people, friends whose certain ruin would result from a crop shortage; and the laboring men

• A Bucyrus-Erie 20-B dragline performs handyman crane duty as it places large drainage pipe into the ditch it has excavated.

who harvested the crops. And then, but not until he was pushed, Dowd issued a statement to the press.

"Water service will be resumed in about ten days," he announced. "Serious crop damage can be averted by the judicious use of water stored behind the checks."

Rebuilding the Canals

The main feeder canals which were shaken down were the backbone of the system which for years has fed Imperial Valley with water from the Colorado River. The new All-American Canal had not yet been put into service. While it was only slightly damaged, it was rendered virtually useless until some of the water was trained back into the Mexican canal.

As soon as Dowd and Hartzog began to move equipment in to rebuild some of the levees they ran into their first big difficulty. The earthquake, in shaking down the banks, had left the earth a sodden, soaking mass, full of potholes and mud. It was impossible to drive an automobile in, impossible to ride a horse in to some of the locations, and certainly impossible to move in with heavy excavating equipment.

Thousands of board feet of timber was used to make crawling mats for the draglines. Then, slowly but surely, the machines began to crawl in toward the places where they were needed.

In one place there simply wasn't any canal left. The banks were shaken down into the bottom of the ditch. It was as level as a floor. To get a pathway built through this stretch in a hurry it was necessary to start bulldozer-equipped Caterpillar tractors working in the middle, pushing earth on up toward the old levees on either side. A hasty bulwark was formed in this way to hold the water when it again was started. Bucyrus-Erie draglines followed along on mats, picking up solid material from deep in the soil to throw up against the levees, forming a dike.

There were other things to do. A thousand men turned out to help fight this battle. Many had to be fed and housed on the job. In a matter of hours the district mobilized equipment for a bunkhouse and mess hall capable of serving meals simultaneously to 100 men. About 200 beds were bought, begged or borrowed. Stoves had to be purchased and brought in to cook the food for the crew. Meals were served continuously. Fresh supplies kept coming in on one of the district's new Marmon-Herrington trucks.

For 15 miles the canal was ruined and for 65 miles more on either side of Solfatara Canal, Cerro Prieto Canal and the Alamo Canal, huge longitudinal breaks split the protective levees wide open. A process of repair known as "coring" was used to rebuild them to hold water. The Bucyrus-Erie draglines were brought in to dig the entire center, or core, of the levee away. It was then put back and compacted by running over it with tractors. Not a fancy job, but it worked.

Mile on mile the draglines chewed their way through. Hour after hour the men worked, testing human endurance to the limit, proving how much the valley meant to them.

This was the kind of spirit which accounted for the resumption of water service to the valley

in about 12 days from the time of the earthquake. About the only crop damage was the loss of one cutting of alfalfa in a few sections.

District's Activities are Varied

The district is headed by M. J. Dowd, chief engineer, under the general direction of a board of supervisors. The board is made up of Evan T. Hewes, W. J. Gregg, Mark Rose, W. E. Young, and Charles Morrow.

The district maintains an extensive system of works. In addition to the usual construction problem of a large irrigation system, new problems constantly are arising. In obtaining water from an interstate and international stream on which water rights must be settled; flood control, storage and hydroelectric works built, the district must deal with other states and with the United States and Mexican governments.

Of major importance from the point of service to the valley is Mr. Hartzog's department of water diversion and drainage construction. During 1940 that department spent $865,000 for water distribution, $240,000 for the repair of earthquake damage and $120,000 for the drainage of lands. It moved 1,500,000 cubic yards of earth. It built 70 miles of new drains, laid 60 miles of new tile line and cleaned 576 miles of canal drains. Cleaning these small canals is the major job. In the old days before Boulder Dam was built the Colorado River carried a heavy load of silt into the drains. Now, with the flow of water considerably clearer, the removal of sand and weeds is the big issue.

Present Equipment Line-Up

As the amount of silt in the ditches decreased, the district added shovels, clamshells and

(*Continued on page 171*)

• Top: One of the district's vegetation burning rigs in action, towed by a Caterpillar tractor. Center: This view gives some idea of what the earthquake did to 65 miles of canal levees. Bottom: Part of the 15 mile sector where the entire canal was demolished. LeTourneau 'dozers mounted on Caterpillar tractors pushed fill from the canal middle to form levees on either bank.

J. C. Kaiser and L. E. Gray of St. Louis grade real estate to order at a profit with three 10-yard scrapers

A FIRM OF PROGRESSIVE St. Louis contractors recently finished a 15,000 cubic yard dirt job at a profit. The job involved the straight excavation of silty clay; nothing more. No heavy deposits of rock showed up in the zone where clay was supposed to be. No major labor strike threatened to disrupt the price estimate. On the face of things it looked like another unusual, run of the mill dirt digging job. But was it?

If it was, maybe there should be more "usual" jobs.

To begin with, the job was done for the real estate firm of Dimmit-Rickhoff-Bayer, and it was done purely for the purpose of improving land value by a process of grading it to more level contours. For that reason alone it is apparent that as low a unit price per acre of grading as possible was desired by Dimmit - Rickhoff - Bayer. Competition in St. Louis is keen. Naturally, then, the contracting partners composed of J. C. Kaiser and L. E. Gray had to bid as closely as possible to land the job.

The success of a close bid depends entirely upon the ability of the bidder to set accurately down on a sheet of paper each direct and indirect cost chargeable to the bidding item, which in the Kaiser-Gray case was a cubic yard of dirt. To these costs the bidder adds taxes, insurance, depreciation of equipment, certain other hidden items, and the reasonable profit he expects to net by doing the job. If he is a progressive contractor, he studies the bidding habits of his competitors with a view toward determining how far underneath the cost of his nearest rival his unit prices will be. He does this because he does not wish to "leave a wad on the table," as they say in construction circles when a generous amount of money is the difference between the low and second low bidder.

Kaiser-Gray's was a tractor and scraper job; one of the kind where a scraper can load, haul to the dumping area, and return for another load over and over again if it does not break down. Still, there were things for Mr. Kaiser and Mr. Gray to know in advance in order to be accurate in their knowledge of what their machines would do.

This brings to light the questionable factors of the dirt moving operation, each of which had to be dealt with thoroughly. What was the analysis of the dirt? What was the average haul? What were the conditions of haul: firm, or soggy? Was there a time limit? What grades were involved? How about loading, hauling and dumping conditions? Would the tractor have available a sufficient number of gear ratios to operate under all conditions at peak capacity, or would it be necessary to go to a lower gear and utilize only half the power?

Is my scraper stable enough to stand upright on sharp turns without upsetting? Can it dump in the bottom of a ditch while standing still? Does the manufacturer rate its capacity at struck measure, so that I can estimate accurately how much bank yardage is being moved? Those were a few of the questions Mr. Kaiser and Mr. Gray answered in their own minds before moving equipment out to the 15 acre tract where dirt moving was scheduled to start.

Tackling the Job

With the contract safely tucked away, the Kaiser-Gray partnership moved three International TD-18 TracTracTors, two model S-90 Bucyrus-Erie scrapers, and an Adams 100 scraper on to two tracts of unimproved land. One of the tracts, about 15 acres in size, was covered only with a slight growth of weeds and grass. Mr. Gray moved in to this tract with the Adams scraper and one of the Bucyrus-Eries.

Several miles away Mr. Kaiser was having his own hands full.

• Operators of the tractor-scraper units peeled off the Missouri clay in 2½-inch layers. By loading over a large area they found it easier to preserve the grade.

• A Bucyrus-Erie 10-yard scraper towed by an International TD-18 TracTracTor picks up a load of St. Louis real estate from a high spot on the Kaiser-Gray grading contract.

His 10 acre tract was covered with scrub brush and some stumps along the edge of a wooded hillside. The stumps were dug out by loosening them with pickaxes and pulling them with an old Caterpillar Sixty. This was done while surveyors hired by the realty company set the proposed cut and fill stakes. Brush was chopped down or pushed over by the Caterpillar, and burned.

Mr. Kaiser's job presented one special problem. Running down through the tract was a ravine 20 feet deep with rough side slopes of approximately 2 horizontal to 1 vertical. Earth from the higher ground had to be dug and hauled in to the very bottom of this ravine to start the fill. A Bullgrader would have been handy, but the Caterpillar was too busy finishing up the clearing to be spared. Mr. Kaiser knew all the features of his new Bucyrus-Erie scraper very well, and without hesitation he sent it down that steep hill to start the fill.

Picking up about ¾ of a load in the bowl at the top of the grade, the operator then closed the apron and lowered the cutting edge down to the ground while travelling in first gear down the ravine slope. The scraper slipped and skidded along but it remained upright, and it bulldozed a smooth road ahead of the curved cutting edge. Not until the tractor was across the ravine and well up the opposite side did the operator stop the machines. At that stage the scraper was down in the very deepest part of the ravine. While standing absolutely still the scraper bowl was raised and the load dumped in a pile, and the machine returned for another load. A few of those initial loads in the bottom of the ditch did wonders toward improving conditions and soon Mr. Kaiser's job had leveled out to about the same grades as those on Mr. Gray's work.

One of the real estate executives happened along about the time the ravine filling was in progress. He looked doubtfully at the International - Bucyrus - Erie combination skittering down the steep slope and smiled with relief when they made the dump safely.

"That ravine," he grinned, "has been sold under various names. If they get too steep to reclaim we call them 'sunken gardens' and people sometimes will pay a good price for 'em that way. But Kaiser is raising that one, isn't he?"

And now that Mr. Kaiser is up out of the ditch, his job can be treated along with Mr. Gray's for the conditions were very much the same after the sunken garden was filled and his machine really started to haul dirt.

General Grading Routine

All of the material was typical Missouri clay, carrying about 35% silt and dampened with about 14% by weight of moisture, the result of recent rains. It was estimated that about 90% of the struck measure capacity of the scrapers would load into them, for this class of material did not bulk more than 10% and it would dig and load well. Because of these ideal loading conditions a piece of ½"x6" plate was welded on the back top edge of the Bucyrus-Erie scrapers to accommodate this easy loading material. Hauling conditions were firm underfoot. It was an ideal job to test the performance of the machines against what Mr. Kaiser and Mr. Gray had anticipated.

The maximum depth of cut was about 6 feet, but this cut dwindled to nothing out at the edges. The general lack of depth (excavation ran about 1,000 cubic yards per acre) made it ideal for the self-contained tractors and scrapers. And the results bore out very well the estimates of the original bid.

The Bucyrus-Erie scrapers were loaded out very often to the control cables in an average distance of 105 feet in an average time of 1.09 minutes by the International TD-18's travelling in first gear. In that gear the TD-18 develops 16,980 pounds of net drawbar pull, so very little track slippage was noted during the loading operation. "Waggling" first the left steering clutch and then the right eliminated most of the slippage

(Continued on page 170)

Grubbing An Airport Site In Georgia

Tractor tools play an important part in cleaning up 600 acres of Georgia terrain for Savannah's new municipal airport

By SPENCER JONES

EVER SINCE Savannah's original $700,000 airport was called to the colors by the U. S. Army Air Corps, the city has felt the need for a civilian landing field. This need, plus the fact that there was no nearby auxiliary landing field for Army use, provided an opportunity for Savannah to build another airport. Mayor Thomas Gamble, A. S. Goebel, city engineer, Spence M. Grayson, city attorney, and Major George C. Heyward, chairman of the airport committee of the city council, took prompt advantage of the situation and secured the allocation of federal funds for the construction of a new airport on a 600-acre area of land furnished by the city.

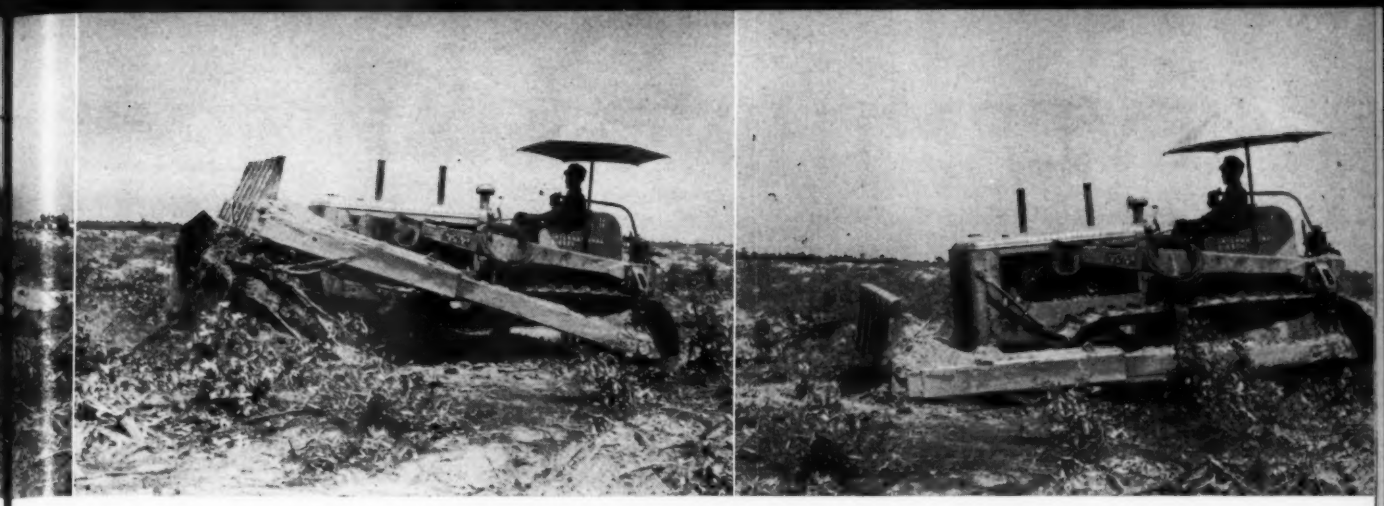
Plans call for three runways, together with paved aprons and taxi strips, as well as an entrance road, gates, fences, curbs, indicator and field and contact lighting, landscaping and incidental work. Works Project Administration expenditures alone, for clearing, grubbing, grading and draining the site, amount to several hundred thousand dollars. The entire project, after the Civil Aeronautics Administration and the Army Air Corps complete the hangars, administration building and other structures, will cost nearly $500,000 if the new airport is designated as a type three, and about twice as much if a type four, port.

Grubbing Operations Started

Actual work started in June, 1941, when 130 laborers began cutting down the trees on the 600 acres of land, some of it thickly forested, but most of it cut-over land thickly dotted with stumps. W. Duncan Wells, assistant superintendent of the job for the Works Project Administration, estimates that standing trees and stumps averaged four feet on centers and varied from mere brush up to forty inches diameter at grade. The stumps, together with their tap roots and major root structures had to be completely removed and burned.

It didn't take the laborers long to cut down the trees, but how to extract the stumps and roots completely was a difficult problem. Many of the stumps had been burned until they were almost flush with the ground, while others were rotted above, but solid underground. After considering vari-

• Left to Right: A. P. Milam's grubber blade tackles a deeply buried stump on the site of Savannah's new municipal airport. Here it is necessary to scoop out a hole around the stump before it can be uprooted. Sometimes Mr. Stump comes out running (see extreme right).



• Right to Left: Mounted on an International TD-18 TracTracTor, a Bucyrus-Erie cable-operated grubber blade bears down on a stump. Hooking the grubber teeth under the stump roots, the tractor moves forward in low gear slowly raising the blade and out comes Mr. Stump.

ous methods as to cost, speed, safety and thoroughness, Major H. U. Wallace, district manager (now deceased), and T. H. Little, district field engineer, decided to grub the stumps out if they could find a machine that would do it.

A couple of Bucyrus-Erie cable-operated grubbers, mounted on TD-18 International Harvester TracTracTors, and owned by A. P. Milam, of Clarkston, Georgia, seemed to be the sort of equipment best suited for the purpose, so they were hired and operators from Milam sent along to run them.

A grubber was something new to the local folks, to whom a stump puller was a hand-powered winch. Here, however, was a Bull-grader with the queerest blade they'd ever seen, with eight ferocious looking teeth along the bottom edge, and the six center teeth welded to a steel plate to form a blade. This menacing device was mounted on a powerful tractor whose operator could raise or lower the toothed blade by moving a little lever.

So an interested and somewhat skeptical crowd gathered to watch Emmett Irwin, one of the operators, tackle his first stump. Lowering the blade so the teeth rested on the ground about six feet away from the doomed stump, Irwin started the tractor forward, allowing the teeth to dig into the ground to the under side of the blade. By that time the blade was just touching the side of the stump. Then, in low gear, Irwin began pushing the toothed blade against the stump and at the same time raising the blade. The vicious teeth took hold and, just as slick as a whistle, out came Mister Stump, complete with roots.

"Ah sweah ah nevah seen nothin' lak that befo,' " remarked one of the negro laborers, "If'n ah was a stump ah'd be hollerin' fo' he'p now, sho 'nough!"

Apparently the stumps didn't holler loud enough, because they're all gone, at the rate of 3½ to 5 acres per day for each grubber. In case anyone wants to be a faultfinder and start asking embarassing questions, such as "Do you mean to say those grubbers took out 12,500 stumps a day? Because that's how many stumps there'd be in five acres if they were on four-foot centers," the answer is, "No, they didn't. The grubbers only went after the tough ones that a Galion grader, pulled by an RD-7 Caterpillar tractor, and two Allis-Chalmers tractors with Baker bulldozers, could not dislodge." And that's no criticism of the grader or the bulldozers, they weren't designed for the purpose of yanking out big and often half-buried stumps.

Digging Out the Buried Stumps

Speaking of those half-buried stumps, the operators developed a highly specialized technique in yanking them. When the grubber teeth couldn't get a grip on some big old sub-surface stump with the tractor at grade level, the operators simply bulldozed a hole around the stump; climbed down into the hole and got at the stump from underneath. To stand beside one of these stump-craters and watch the stump scurry out of it under the urgings of the grubber was like watching one prehistoric monster chasing another out of its hiding place.

After yanking out a stump, the grubber operator didn't just leave it lying there, but put the tractor into high gear and shoved the stump over to the nearest brush pile for burning. None of the logs from the standing timber were burned, however; instead, they were sold for pulpwood.

Priority is being given the new Savannah Municipal Airport because it is a necessary part of the defense works of the Southeast. A chain of army and navy air bases, camps, forts and supply depots extends from the Carolinas to Louisiana and is being improved and added to constantly. In case of threatened invasion, the new airport might well become overnight a bomber or interceptor base for the protection of seacoast shipbuilding plants or strategic inland railroad, power, steel and ordnance centers.

"EVERYTHING IS DUCKY"

Our old friend, William Z. Williams, the inimitable shovel salesman, turns an unfortunate misunderstanding into a profitable deal

By FREDERIC BROWN

Illustrated by J. A. Patterson

Letter from William Z. Williams, Hotel Hayes, New Orleans, Louisiana, to D. Itch, president, the D. Itch Digger Company, Circle Center, Ohio:

Dear Mr. Itch:

I'm leaving New Orleans today to spend a week or so taking in the Jubilee Southern Fair being held at Watchee, Florida. It opens next Monday but I'm starting right away because I got a tip that may lead to a sale that will pay my expenses on the trip. And that won't hurt a bit, because I'm down to my last couple of hundred bucks and got to start making sales again.

I learned accidentally that a man named Throttlebottom, who is now in New Orleans and who is leaving for the fair today, is in the market for a flock of excavators, or at least one of them. He's connected some way with the fair. I called his hotel and found he's leaving on the 5 o'clock train this evening and I figured that instead of contacting him here while he's in a rush, I'll play smart by taking a reservation on the same train to Watchee. That way I can get next to him while he's en route and has lots of leisure. I think you can count on the sale being made. I've got an hour to kill before train time and thought I might as well spend it writing to you as any other way, and also so you could note my new address on the books. For the next week or two address me General Delivery, Watchee, Florida.

William Z. Williams

P. S.

I found my watch was wrong and I didn't have time to mail this before train time as I had to run for the train. I'm on it now, and I've spotted Mr. Throttlebottom by tipping the porter to point him out. I'm writing this in the smoker and will give it to the porter to mail at the next station.

I see a poker game is starting up at the other end of the smoker and it looks like Mr. Throttlebottom is going to sit in. So everything is ducky. I'll get in the game and get to meet him. And probably make some money. I'm the best poker player I know of.

William

"... I had to run for the train."

Telegram from William Z. Williams, Moonbury, Mississippi, to D. Itch, president, the D. Itch Digger Company, Circle Center, Ohio:

PLEASE WIRE HUNDRED DOLLARS CARE TELEGRAH COMPANY WATCHEE FLORIDA STOP I'M THE SECOND BEST POKER PLAYER I KNOW OF.
WILLIAMS

Letter from William Z. Williams, Sunbury, Mississippi, to D. Itch, president, the D. Itch Digger Company, Circle Center, Ohio:

Dear Mr. Itch:

I suppose you have sent the money I asked for in the telegram, but I'm writing this to explain further. Especially as I can't seem to get Mr. Throttlebottom in conversation. He's reading a copy of Variety and just growls if anyone talks to him. Wonder what an excavating man wants to read a theatrical magazine for?

Yes, I got in the poker game. I lost a hundred and seventy of my two hundred dollars. Mr. Throttlebottom didn't win it; he lost a few dollars himself. The guy who won and who started the game is a Mr. Gerry Ray of New York. He is a swell poker player. Fur-

"He's reading a copy of Variety and just growls if anyone talks to him."

thermore he's a nice guy and I like him a lot, even if I lost my money to him. But this Mr. Throttlebottom is a tough egg. He won't talk business. He's got a funny sense of humor, though. I said something about moving dirt and he said there's so much dirt everywhere that what would anybody want to bother moving it for?

Anyway, thanks for the hundred advance commission you're sending me.

William Z. Williams

Telegram from D. Itch, president, the D. Itch Digger Company, Circle Center, Ohio, to William Z. Williams, Watchee, Florida:

WIRING HUNDRED HEREWITH STOP STAY OUT OF POKER GAMES ON TRAINS STOP YOU WERE OBVIOUSLY TAKEN BY A CARD SHARP

D ITCH

Telegram from William Z. Williams, Hotel Wescott, Watchee, Florida, to D. Itch, president, the D. Itch Digger Company, Circle Center, Ohio:

RUSH SHIPMENT THREE STANDARD Z-EIGHT-B THREE-EIGHTHS YARD CLAMSHELLS TO ME AT WATCHEE LETTER FOLLOWS

WILLIAMS

Letter from William Z. Wilams, Hotel Wescott, Watchee, Florida, to D. Itch, president, the D. Itch Digger Company, Circle Center, Ohio:

Dear Mr. Itch:

This confirms my telegram asking you to ship three Z8B three-eighths yard clamshells. I presume they're on the way by the time you get this. What I didn't tell you in the telegram is that I haven't sold them yet. I refrained from mentioning this because I know you have a silly prejudice against shipping equipment before it is actually sold. But I am sure I can sell these and having them on the spot ready for quick delivery will be a big selling point.

I still haven't got Mr. Throttlebottom to talk business, but I did manage to get a couple of facts out of him. I overheard him mention to someone else that he intended to operate three diggers at the Jubilee fair, and that he hasn't bought them yet but will shortly. I managed to horn in and ask one question, what size bucket he used. He said the smallest he could get because they were the most profitable. Then he turned back to the other guy and started talking about the carnival business.

I don't get why the smallest are the most profitable, but that's his business. And since he hasn't bought them yet and since the three-eighths yard is the smallest standard stock model we have, I decided to get his three on the way. We've just checked in at Watchee and I'm going to go up and beard him in his den, or rather his room right now and get the order.

William

Telegram from William Z. Wil-

"Yes, I got in the poker game and now I'm the second best player I know of!"

"We operated all three clamshells yesterday, and did the biggest business of any concession on the fair grounds."

liams, Watchee, Florida, to D. Itch, president, the D. Itch Digger Company, Circle Center, Ohio:

AN AWFUL MISTAKE HAS BEEN MADE STOP IF THOSE THREE CLAMSHELLS HAVE NOT YET BEEN SHIPPED FOR HEAVEN'S SAKE HOLD THEM

WILLIAMS

Telegram from William Z. Williams, Watchee, Florida, to D. Itch, president, the D. Itch Digger Company, Circle Center, Ohio:

CAN YOU WIRE ANOTHER HUNDRED DOLLARS AT ONCE QUESTION MARK

WILLIAMS

Telegram from D. Itch, president, the D. Itch Digger Company, Circle Center, Ohio, to William Z. Williams, Watchee, Florida:

MACHINES ALREADY SHIPPED AND ARE ALMOST THERE BY NOW STOP NO USE TRYING TO TRACE AND STOP THEM NOW STOP YOU CAN STOP THEM AND SEND BACK WITHOUT UNLOADING STOP ALL SHIPPING COSTS DEBITED TO YOUR ACCOUNT STOP WILL NOT SEND ANOTHER HUNDRED EXPENSE MONEY AS YOUR ACCOUNT BADLY IN RED WITH PREVIOUS ADVANCE AND TWO-WAY SHIPPING CHARGES ON CLAMSHELLS STOP IF YOU EVER PULL ANYTHING LIKE THAT AGAIN YOU'RE FIRED STOP I OUGHT TO FIRE YOU NOW

D ITCH

Letter from William Z. Williams, Watchee, Florida, to D. Itch, president, the D. Itch Digger Company, Circle Center, Ohio:

Dear Mr. Itch:

Several days have passed since I got your telegram refusing to send me additional expense money and almost firing me. I'm sorry you took that attitude, Mr. Itch.

You see, the mistake I had made was a quite natural one. How could I have guessed that Mr. Throttlebottom was a carnival man and that the three rigs I heard him mention he was going to buy and operate were slot machines? You've probably seen them. It's a toy clamshell in a glass case. You put in a nickel and operate a few controls and the bucket goes down in some candy and dips up a tenth of a cent's worth and gives it to you through a slide and just misses the prizes that are scattered around in the candy.

If Mr. Throttlebottom hadn't been so hard to talk to, I'd have managed to find that out before I ordered three machines for him, but I learned since that he had a lot of family troubles on his mind and was sorry he'd been brusque with me and refused to talk business so I got the wrong impression of his needs.

Of course learning that didn't help any and after I sent you the telegram trying to stop the order from being filled, I sat down in the hotel lobby to worry a while. Then Mr. Gerry Ray came along and we played some two-handed stud and I lost every cent I had left out of the advance commission you sent me.

But everything is ducky now, Mr. Itch. I enclose a check for first payment on the three Z8B's, and will send a check for the balance within a few days.

Naturally, you'll want to know how I accomplished this, particularly when I tell you that the deal I have made will lead to the sale of more machines in the near future and I'm having the contract drawn up now. So I'll explain.

(Continued on page 172)

ROCK digging—that's the real test of shovel performance—and if you have a *real* Rock Shovel you don't have to worry about output in *any digging!*

The fact that no welded shovel boom of Northwest design and construction has ever failed, combined with the Northwest Dual Independent Crowd that utilizes force other shovels waste, means dependability and output—and you can't have too much dependability—or output today. Getting the job done is what counts. Plan for a *proved* rock shovel—a *Northwest Rock Shovel.*

NORTHWEST ENGINEERING CO.
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NORTHWEST

BUILT IN A RANGE OF 18 SIZES . . .
3/8" CU. YD. CAPACITY AND LARGER

If it's a real Rock Shovel you won't have to worry about output in dirt

Equipment
you ought to KNOW ABOUT

Transit crane

Manufacturer: Bucyrus - Erie Company, South Milwaukee, Wis.

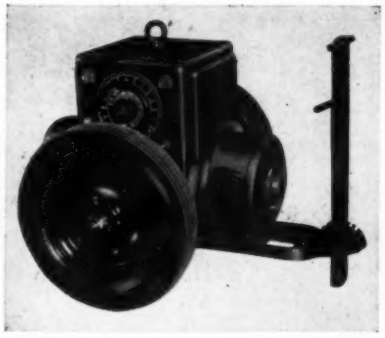
Claims: With flexibility to meet a wide range of job requirements and conditions, the 15-B and 22-B transit cranes are fully convertible from crane to clamshell, dragline, shovel and dragshovel service, and are also designed for quick conversion from carrier to crawler mounting for jobs inaccessible to wheel mounted units. The smaller of the two transit cranes is the 15-B with a 10-ton maximum crane rating and convertible to ½-yard excavator. The second unit is the 22-B with a maximum crane rating of 20-tons and is convertible to a ¾-yard clamshell, dragline, shovel or dragshovel. The wheel mounting provides an all-welded base giving maximum strength per pound of weight. Rear axles in tandem, mounted on an equalizer beam, assure full traction over rough ground. Dual worm drive applies the power smoothly; the rugged transmission provides ten forward and two reverse speeds. Use of two identical engines, one for propelling, the other for handling hoist, swing, etc., simplifies maintenance and repair. Maximum speed on level ground is 27½ mph for the 15-B, and 31 mph for the 22-B. The 15-B is equipped with vacuum booster-set air brakes on all four rear wheels and the 22-B carries Westinghouse internal air brakes on the rear wheels. Revolving units of the transit cranes have the same features which have made outstanding performance records on the standard 15-B and 22-B machines.

For further details about the equipment on this page please write to the manufacturer, mentioning Excavating Engineer.

Welder trailer

Manufacturer: Hobart Brothers Company, Troy, Ohio.

Claims: Two-wheeled, lightweight, pneumatic-tired trailer for mounting 200, 300, 400 ampere Hobart electric welders, designed for towing up to 35 mph. Mounting is accomplished easily by means of three bolts in the frame of trailer which register with three holes in the welding machine. The unit can be moved by hand due to its low underslung construction, narrow tread and

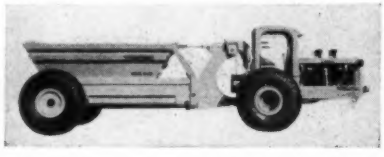


method of balancing. It measures 54″ long, 45″ wide, 27″ high (over tires), 13″ axle center.

Hauling; Power control units

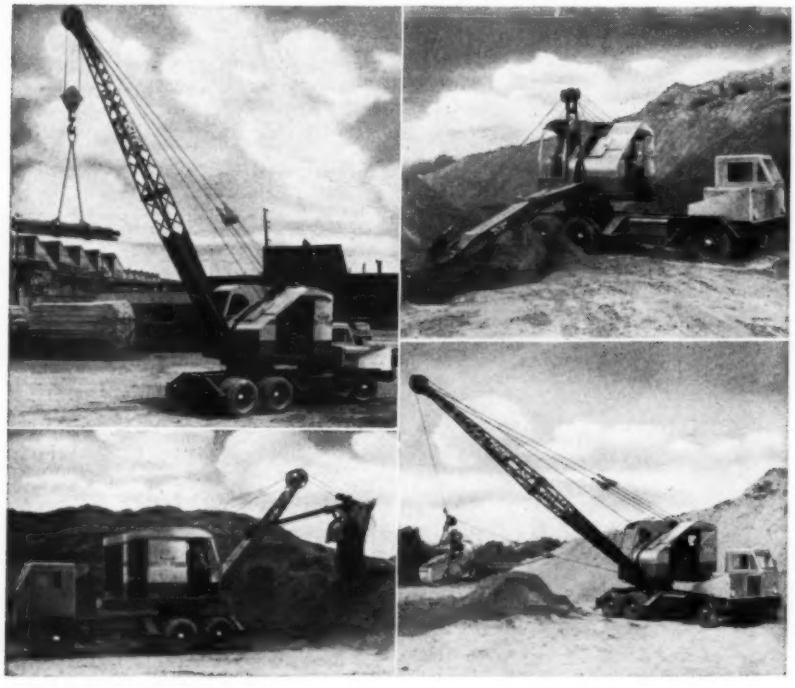
Manufacturer: R. G. LeTourneau, Inc., Peoria, Illinois.

Claims: In order to fully utilize the power and speed of the Super C Tournapull, the W210 Tournatrailer with heaped capacity of 17



cubic yards has been introduced. The unit has been designed with flared side and end walls to give the bowl an 8′x12′8″ opening at the top for quick, accurate loading by big dragline or shovel. The trailer is powered by the 150 hp. Tournapull which has four forward speeds and a reverse. Another feature of the unit is: patented self-cleaning sliding bowl that gives end-dumping or spreading in layers.

The new R6-7-8 two-drum power control unit has been designed for interchangeability. The face plate is drilled to allow easy mounting on either D6, D7 or D8 Caterpillar tractors. The unit has a line pull of 5,000 pounds. Other features are: fewer moving parts, larger brakes and clutches, more cable capacity.



3 ways to make your Wire Rope dollar go farther...conserve steel tonnage too

(No. 9 in a series of informative articles for wire rope users prepared by the Macwhyte Wire Rope Company. Previous articles in this series are available on request on your company letterhead.)

1 Buy PREformed; it's best, costs less

There have always been sound reasons for buying PREformed wire rope. Careful tests time and again have proved it gives better service than non-preformed, costs less in the long run, saves time because fewer shutdowns are necessary for replacements.

Fig. A — PREformed ropes are free of internal stress, have high fatigue resistance.

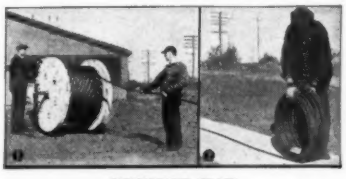
Today there's another reason why it's most important to buy PREformed: by doing so you help national defense.

It takes just as long at the steel mill to make steel for non-preformed as for PREformed wire rope. Yet PREformed will outlast ordinary wire rope on most jobs. When you buy Macwhyte PREformed, therefore, you're helping conserve not only steel which America greatly needs, but also the time of those who make it.

2 Install Rope Carefully

It's so easy to kink or twist rope when installing in a hurry. Such "haste makes waste." Kinking and twisting definitely shortens rope life.

With reasonable care and speed you can prevent both. Here are some simple suggestions on unreeling and uncoiling rope . . . operations where both kinking and twisting are apt to occur.



CORRECT WAY

Unreeling—The reel should be revolved and the rope taken off the way it is put on the reel. Illustration No. 1 shows one method—put a shaft through the center of the reel and jack it up so that the reel will revolve freely. Pull the rope straight ahead, keeping it taut to prevent it from loosening up on the reel. A board held against one flange may be used as a brake to keep the reel from revolving too fast.

Uncoiling—Roll the coil along the ground so the rope lies straight as shown in Illustration No. 2. There will be no twist or kink in the rope if these instructions are followed.

INCORRECT WAY

Illustrations 3 and 4 show incorrect ways of unreeling and uncoiling. Notice that the reel and coil cannot revolve and therefore the rope is twisted as each turn is taken off.

3 Inspect Your Ropes Regularly

Once wire rope is on their equipment many users overlook the value of regular inspection. Such negligence is costly. It can be avoided by regular inspection which takes far less time, is much less expensive than too frequent buying and replacing for lack of knowledge of their condition.

Pictured here are a few of the most common "Wire rope enemies" which, if *not* eliminated or kept under control, can easily reduce the service life of your rope as much as 50%. Also given here are suggested methods of avoiding these dangers.

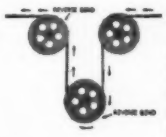


Fig. B — Reverse bends— Years of experience and many tests have proved that reverse bending and excessive wire fatigue reduce rope life as much as 50%.

Where reverse bending cannot be eliminated, use the largest sheaves possible and place them as far apart as possible. By getting the MAXIMUM distance between reverse bends, you reduce fatigue—provide longer service.

Fig. C—Sheaves too small. This rope was forced to travel continuously over sheaves whose diameters were too small. Frequent inspection would have shown this danger. A change to a larger sheave would have solved the problem. (Note: PREformed wire rope would have lasted much longer in this case.)

Fig. D—Drum abrasion and abuse caused this. The rope was scuffed over and over against previous wraps on a flat-faced drum. This could have been prevented by even winding and grooved drums.

Fig. E—Kinking caused this. This dog-leg, or kink, was finally straightened out . . . but notice the uneven wear at the point where the kink had been. Proper handling during installation could have prevented this. Beware of dog-legs! They're expensive.

Why Guess? When you can KNOW!

Macwhyte Company wants you to know that they will be glad to offer recommendations of the correct ropes for your equipment and, if you like, discuss with you possibilities of getting more from the ropes you are using . . . should there be any doubt in your mind as to whether you are getting the best service.

NO. 589
MONARCH
Whyte Strand
PRE-FORMED
. . . the CORRECT rope for your equipment
Internally Lubricated — made with 2 kinds of wire — Laboratory Tested —Field Proved
MACWHYTE COMPANY
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Manufacturers of Wire Rope to meet every need— left-&-right-lay braided slings—stainless steel wire rope—monel metal wire rope—aircraft cable, aircraft tie-rods, and "Safe-Lock" cable terminals.
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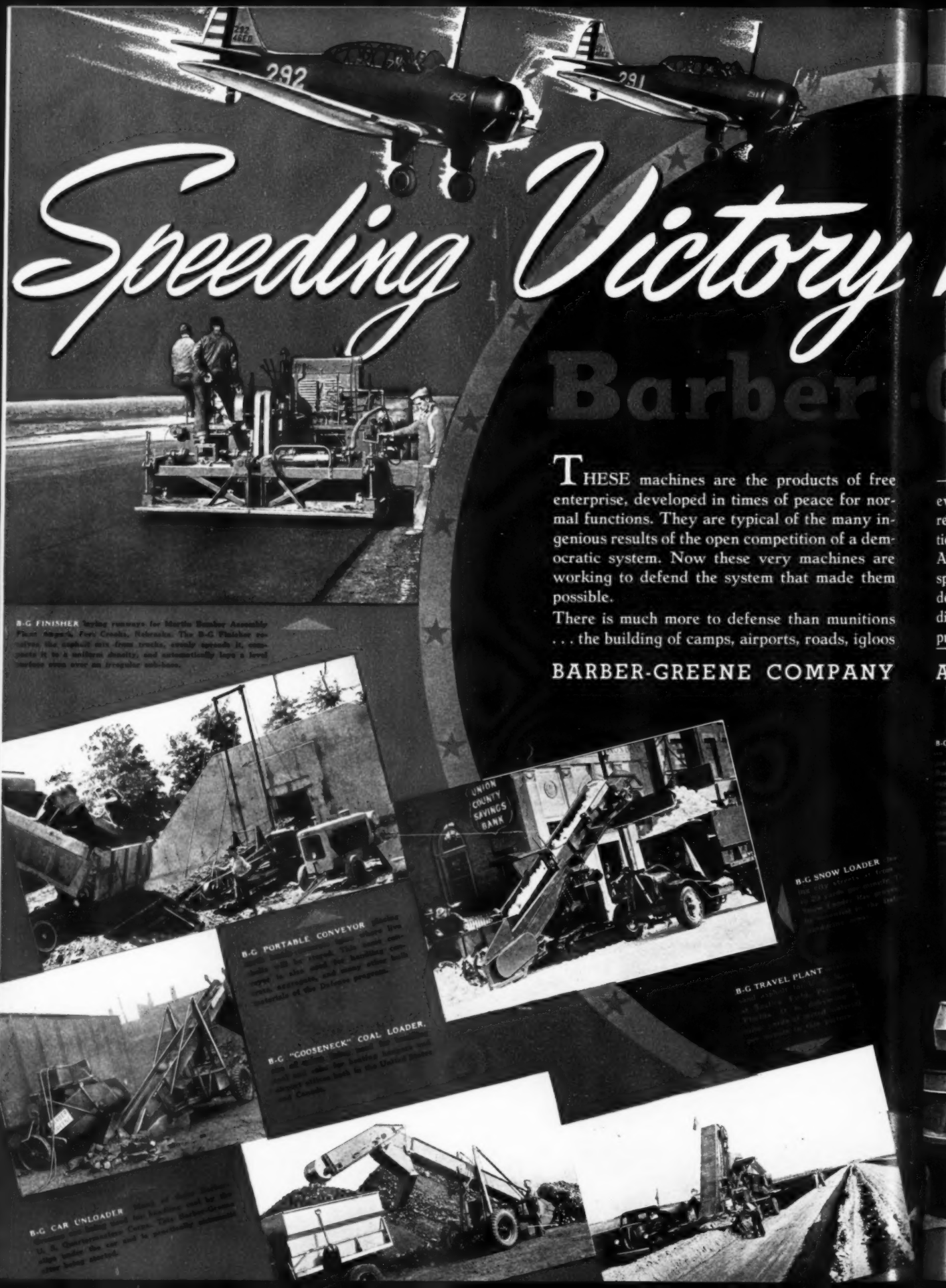
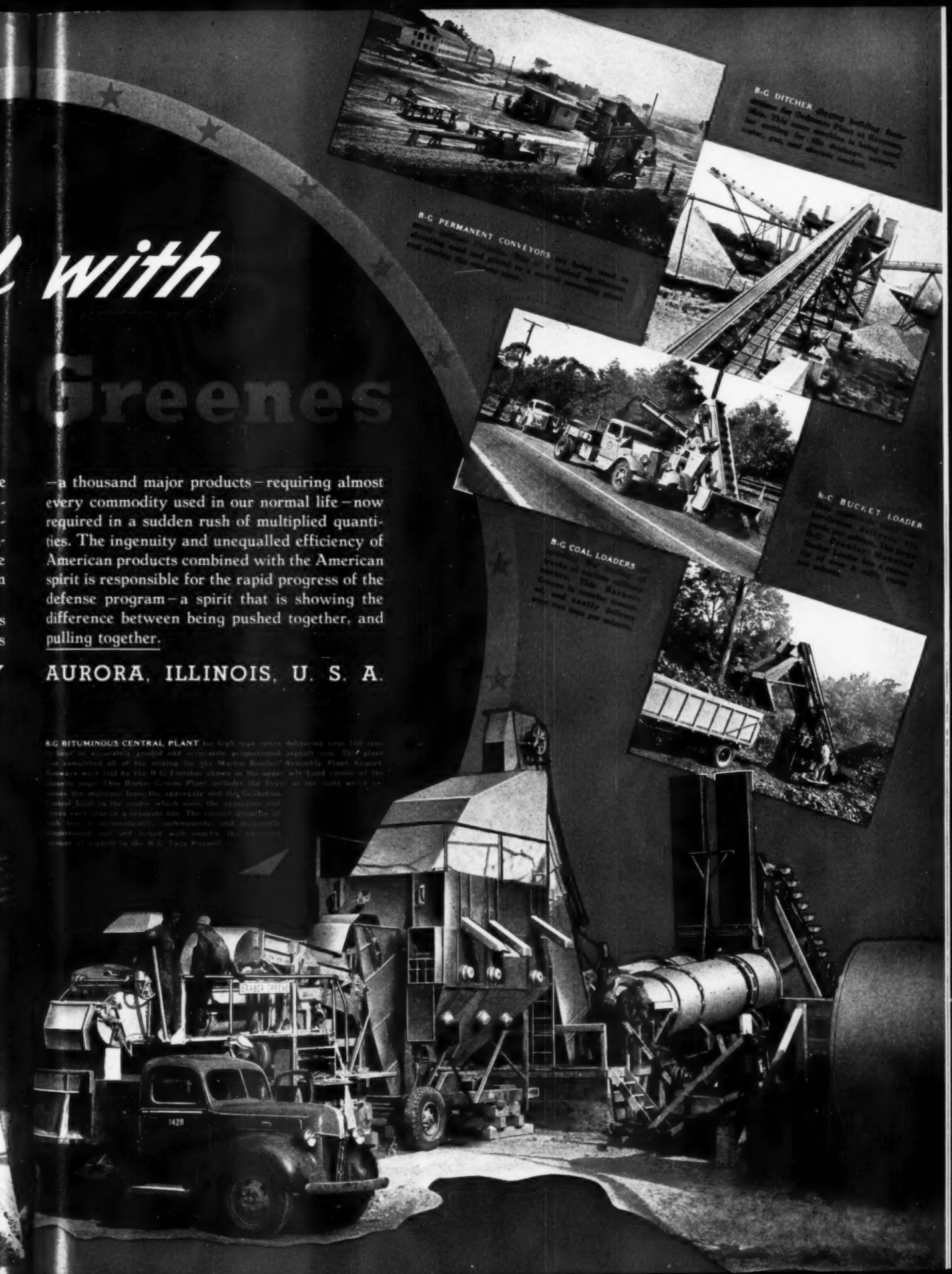

Speeding Victory
Barber-G
THESE machines are the products of free enterprise, developed in times of peace for normal functions. They are typical of the many ingenious results of the open competition of a democratic system. Now these very machines are working to defend the system that made them possible.
There is much more to defense than munitions . . . the building of camps, airports, roads, igloos
BARBER-GREENE COMPANY
B-G FINISHER laying runways for Martin Bomber Assembly Plant Airport, Fort Crook, Nebraska. The B-G Finisher receives the asphalt mix from trucks, evenly spreads it, compacts it to a uniform density, and automatically lays a level surface even over an irregular subbase.
B-G PORTABLE CONVEYOR
B-G "GOOSENECK" COAL LOADER
B-G CAR UNLOADER
UNION COUNTY SAVINGS BANK
B-G SNOW LOADER
B-G TRAVEL PLANT



l with Greenes

—a thousand major products—requiring almost every commodity used in our normal life—now required in a sudden rush of multiplied quantities. The ingenuity and unequalled efficiency of American products combined with the American spirit is responsible for the rapid progress of the defense program—a spirit that is showing the difference between being pushed together, and pulling together.

AURORA, ILLINOIS, U. S. A.

B-G BITUMINOUS CENTRAL PLANT

Shots from the FIRING LINE

U. S. Lends $20,000,000 for Pan-American Highway

Approval by the U. S. Public Works Administration of a $20,000,000 loan to the five Central American republics to enable them to speed work on their parts of the Pan-American Highway, the land lifeline to the Panama Canal, has been announced in Washington.

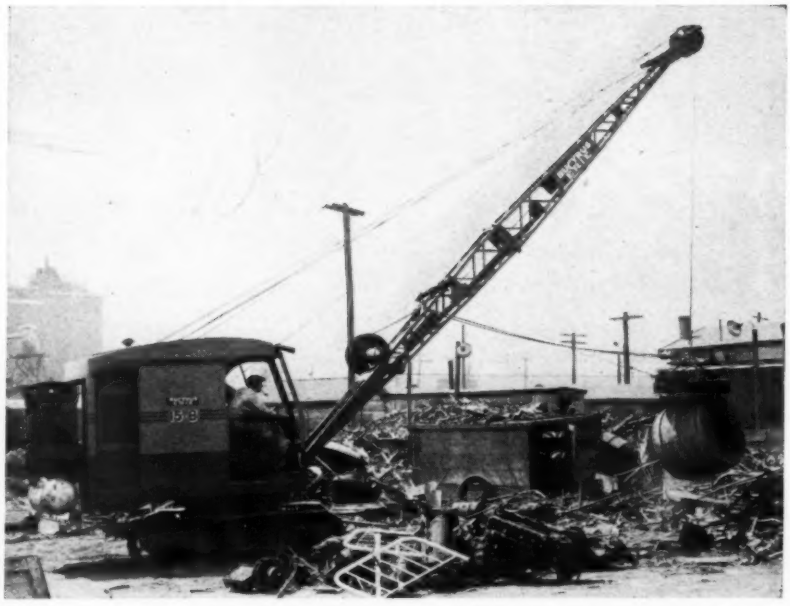
The loan was made from a special fund created by congress after President Roosevelt called attention to the urgent need for completion of the highway to Panama.

Importance of completing this route to the canal was further emphasized by recent submarine attacks on vessels along the Eastern seaboard. The only present method by which supplies or troops can be sent on a large scale to the Canal Zone is by sea.

Costa Rica will receive $8,000,000 of the $20,000,000 loan. Guatemala, El Salvador and Honduras already have an all-weather highway over which troops and supplies could pass to Panama without too much difficulty. The bulk of $12,000,000 will be spent in Nicaragua, with the remainder going to iron out rough spots in the other three countries.

Sixty-two per cent of the highway from Mexico to Panama is now passable, it was reported at the time of the loan approval announcement. A point 80 miles south of Mexico City to the Guatemalan border was described as one of the worst stretches. Mexico, under a recent agreement, received a virtual blank check on the Export-Import Bank to complete the rest of the highway to its southern border.

It was reported that of the 356 miles of the Pan-American Highway route through Costa Rica, 250 miles are still merely trails. Costa Rica, it was announced, will spend its $8,000,000 loan, plus an additional $4,000,000 from its own treasury, in making these 250 miles passable.



• Los Angeles By-Products Company finds a Bucyrus-Erie 15-B machine a handy unit for scrap metal handling operations. Generator attached to rear of cab supplies current for the electromagnet.

Crane Serves as Yard Handyman

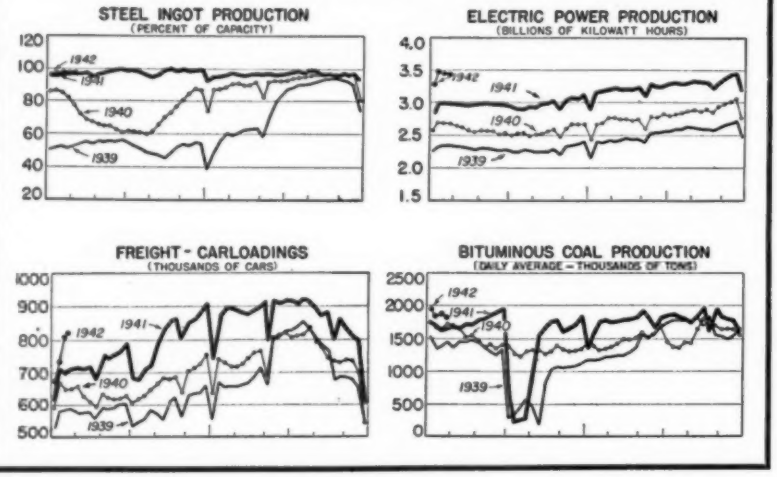
By Floyd Suter Bixby

In the heart of the manufacturing and industrial section of Los Angeles a machine usually associated with the dirt excavating business, has taken up the slack in a plant whose output has been doubled by its war orders. The plant is the main office and yard of the Los Angeles By-Products Company, and the variety of "excavation" includes broken glass, tin cans, junked automobile bodies, scraps from the foundry, steel machine shop shavings and heavy pieces so large that they must first be broken up by the machine before they can be loaded.

The machine is a Bucyrus-Erie 15-B, rigged as a crane, carrying a 35-foot boom and powered by a Buda 54 horsepower motor. Shell butane is used for fuel, both for the crane's power and for operating an auxiliary Ford V-8 engine driving a direct current generator when a lifting electromagnet is used. The V-8 motor, hooked directly to the generator, is carried on the back of the crane cab above the counterweight and adjacent to the Buda motor, close enough that the tail swing radius of 7'-6" has not been greatly increased.

The company yard, located as it is in the metropolitan manufacturing section, does not cover more than about 30 acres. One of the chief problems faced by Manager C. M. Gregg of the firm was that of increasing the storage space in his yard by eliminating pathways, access roads and shallow piles of the metal by-products. By piling materials higher with its 35 foot boom over a

BUSINESS INDICATORS



Save costly tool-changing TIME...cut accidents

Costly tool changing time is changed into productive drilling time by the modern safety-first built-in tool wrenches now available on all Bucyrus-Erie blast hole drills.

The modern built-in tool wrench and safety-first operating platform eliminates the back-breaking labor of handling heavy tool wrenches. On most jobs they cut the time for tool changing in half. They give your workmen a safe, dry platform to work on that eliminates a lot of the danger of broken legs and smashed toes. They make it easier for men to work fast.

These tool wrenches are available on all Bucyrus-Erie blast hole drills. Write for further information.

Bucyrus·Erie

SOUTH MILWAUKEE, WISCONSIN

For your convenience in writing to Bucyrus-Erie Co., you will find a card bound in this issue.

smaller area, the crawler crane has measurably increased the company's storage space. Working at a 50 degree angle the top of the 15-B's boom point sheave is 31'-4" in the air.

In performing its duties, the crane must maneuver in cramped quarters between piles of the stored material. This requirement was, of course, taken into consideration before purchase of the machine, but it has caused no concern since. Under the skilled touch of Operator Milton Fuller the machine crawls in and out of many a tight squeeze to do its "excavating."

The only time it resembles an excavator is when a ⅝ cubic yard Owens clamshell is used for loading steel machine shop shavings into open railroad cars. These shavings are dangerous and hard to handle, but a clamshell is very well adapted to that work. About 200 tons of shavings were loaded out in a fast six hour run.

Not a small part of the by-products leaving the yard are hundreds of tons of old tin cans. They are first burned to remove paper and foreign matter, and then run through a press which crushes and bales them. The crane loads them out in railroad cars for use as a precipitate in the copper smelting industry. The clamshell is used for loading 250 pound bales of the cans, and the yard foreman learned long ago that it takes just one hour and 35 minutes to spot the crane and load out a standard car.

The machine spends about 50% of its time breaking heavy foundry pieces up to nine tons in weight, loading them out for shipment after they are broken. A "breaking pen" was built of heavy No. 9 gage wire screen with a one-inch mesh, so that flying pieces of broken steel would not injure men working nearby. A screen was also put on the front of the cab between the operator and the bursting iron.

The heavy pieces, which average about four tons, are picked up one by one and placed in the pit. Using 22 volts and 300 amperes of direct current on the Schrader electromagnet, a 1,200-pound skull cracker is picked up to the top of the boom and dropped on each piece. One blow is generally sufficient. The broken parts are loaded out in trucks, with breaking being done between loads. This crane breaks and loads about 25 tons of scrap per hour.

The company is engaged at present in manufacturing flanged pipe fittings on a rush war order. This work made it advisable to store materials in other yards owned by the company. The crane travels from a mile to ten miles back and forth between jobs on a commercial trailer, taking about 20 minutes to load and about 15 minutes to unload.

Albert H. Aldinger

After an illness of two weeks duration, Albert H. Aldinger, prominent mid-west contractor, died February 9, in a Detroit hospital at the age of 65.

As president of the Walbridge-Aldinger Company, general contractors, Mr. Aldinger supervised the construction of the Federal Building, Olympia, United Artist Theater, the foundation of the Penobscot Building and several General Motors and Chrysler Corporation plants.

Mr. Aldinger had lived in Detroit for 26 years. He had both bachelor's and master's degrees from Purdue University and was a fellow in Tau Beta Pi, honorary engineering fraternity. He was a member of Ancient Landmark Lodge, F. & A. M. of Winnipeg, Manitoba; Palestine Lodge, R. A. M., and Detroit Commandery No. 1.

He is survived by his widow, Lucy; two sons, Albert H. Jr., and Cyrus B., and two daughters, Miss Marie Aldinger and Mrs. J. M. Scott, both of San Antonio, Texas.

January Construction Ahead Of Last Year

Building and engineering contracts awarded in the 37 eastern states during the month of January amounted to $316,846,000, according to F. W. Dodge Corporation. This represented a moderate increase over the $305,204,000 recorded for January of last year. In

There's Always *Exactly the Right Amount* of Power...with a Pierce Governor!

● Few conditions require a governor to be more accurate and sensitive, yet rugged and thoroughly dependable, than grader work. The load on the grader varies throughout the full range, suddenly, unpredictably—as it scrapes through soft surface dirt into hardpan, clay, rock . . . and out again. Then *instantly—automatically*—Pierce Flyball Governors adjust the throttle of the motor to handle the changing load without stalling or racing!

This takes sensitive, split-second control, which Pierce Flyball Governors have long demonstrated in actual service in many fields. Efficient design, precision construction, special heat treatment and hardening, and over-size ball bearings assure minimum wear and long life in toughest service. That's why leading equipment manufacturers use Pierce Flyball Governors as standard equipment! That's why it will pay you to insist that any equipment you buy, requiring a governor, is Pierce equipped!

When Your Equipment Needs Reconditioning check the governor. It may need repair or replacement, too. A new Pierce Governor will help restore peak performance. Get in touch with your nearest Pierce distributor, or write the factory.

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More Accurate, Last Longer, Give You Peak Performance From Your Equipment.

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Excavators suitable for all types of work are a profitable investment. Koehring excavators are *quickly and easily* convertible . . . more operating advantages for all types of jobs. Keep your investment down by having a Koehring on the job...one machine for all jobs . . . shovel, clamshell dragline or pull shovel . . . handling material, steel, piling, concrete buckets, forms. Easy steering and moving in tight spots, accurate boom control, stable operation and quick moves on or between work locations are Koehring advantages for high speed production.

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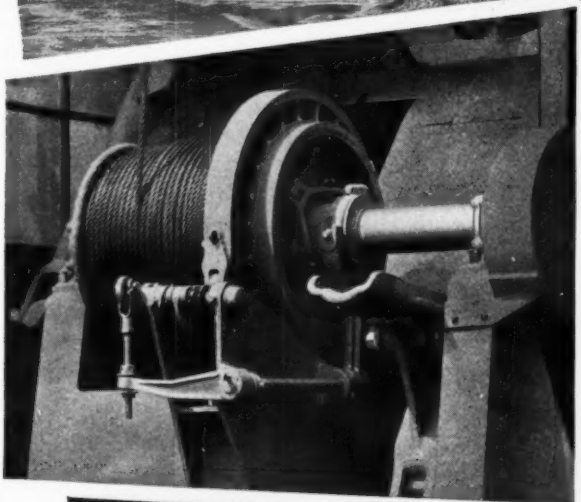
MILWAUKEE • WISCONSIN



Third drum for pile driving can be installed for dragging piles to the leads . . . operated by independent friction clutch.

KOEHRING HEAVY DUTY

HEAVY-DUTY CONSTRUCTION EQUIPMENT

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dollar volume, non-residential building was up four per cent from the corresponding month of 1941, residential building was down eight per cent, and public works and utilities construction (heavy engineering) was up 21 per cent.

While new residential building exclusive of hotel, barracks and dormitory projects, decreased 17 per cent in dollar volume from January of last year, the decline in number of new family dwelling units contracted for was less than two per cent, a lower average contract price per unit, reflecting the shift of the residential building program to low-cost defense housing units.

Commenting on the January construction record, Thomas S. Holden, president of F. W. Dodge Corporation stated: "While the contract volume for the month showed a slight increase over January of last year, it fell considerably behind the $500,000,000 average monthly volume for 1941, and also measurably behind the December 1941 figures. Apparently this is entirely due to the fact that this year's big war construction program has as yet been only partially scheduled by the War Production Board. It is generally anticipated that this year's total construction volume will approximate that of 1941, the post-depression record year."

Dr. Nelson Says . . .

(From an address by Dr. Wilbur A. Nelson, Administrator of Mining Branch, War Production Board, at the annual dinner of the Colorado Mining Institute, Denver, January 24, 1942)

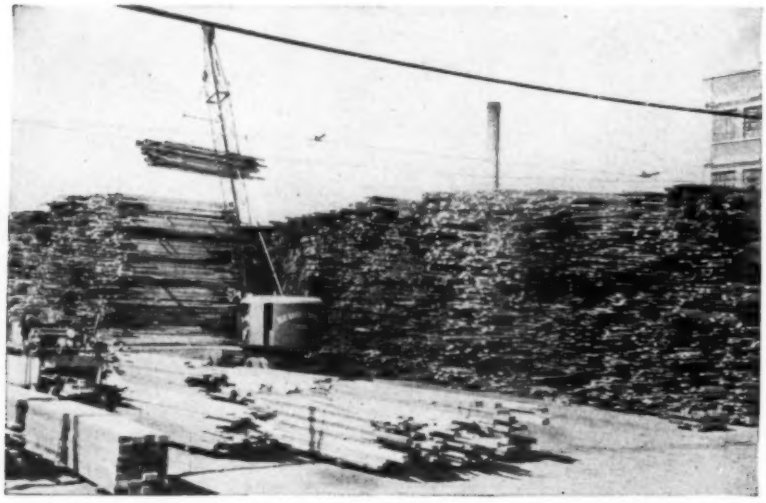
"The pressure of miltiary demands for precision tools is forcing some manufacturers to 'sell mining machinery short' . . .

"The makers of mining machinery should be placed on a complete parity with the makers of munitions to successfully complete war production aims . . .

"An order 'freezing' the amount of production that mining machinery manufacturers can provide for non-mining enterprises is being urged in Washington by the Mine Priorities Division . . .

"Mining machinery needs in 1942 may be increased as much as 20 per cent over 1941 production since increased production of strategic minerals is so vital to the war program . . .

"Any prospector will be granted a serial number as if he were already a mine and can obtain priorities assistance after he has proved he is engaged in a sound mining venture on some strategic mineral . . . "



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N. Carolina's Highway Plans

By Bethune Jones

After being warned by Governor Broughton that "there is almost certain to be a reduction in highway revenue," the North Carolina State Highway and Public Works Commission made plans in January to preserve the state's road system in the eventuality of a 50 per cent drop in funds during the next fiscal year.

Commission Chairman Ben Prince estimated that if automobile and tire rationing cuts off revenue by 20 per cent during the last six months of the current fiscal year, and 50 per cent during the 1942-43 fiscal year, sufficient funds would remain only to meet debt-service payments and to maintain existing highways.

Besides emphasizing the need for care in estimating anticipated revenues for highway use, Governor Broughton also suggested that the commissioners consider establishing a reserve fund for post-war use. Some other states are adopting this policy, he said.

After considering disposition of a $3,000,000 allocation by the governor from the highway "surplus," or unallocated funds, the commission decided to distribute it among the 10 divisions on a basis of area, population, motor vehicle registration, and road mileage. The money will be spent for improve-

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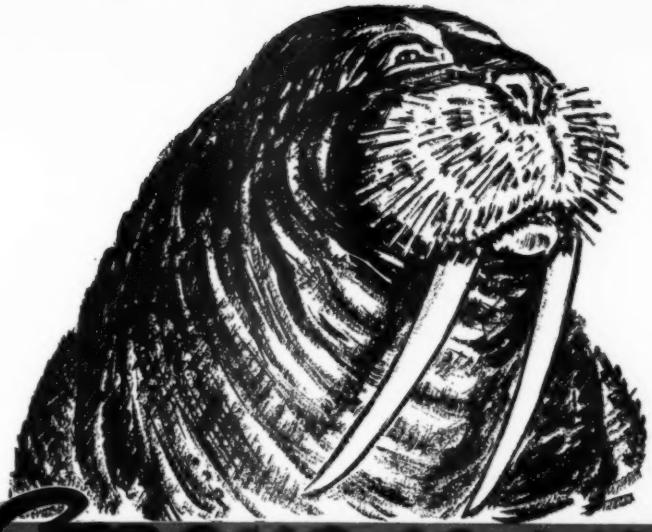
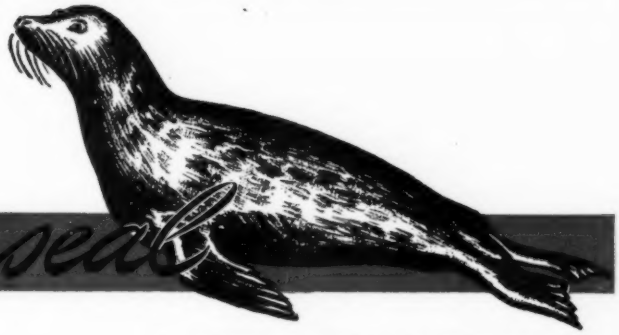


STRONG AS A WALRUS...



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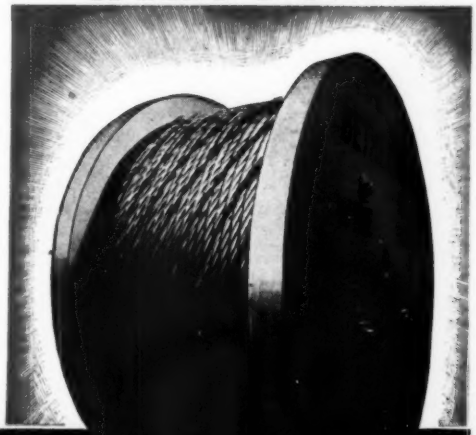
The Form-Set (preformed) construction means that the rope is limber, relaxed, easy to handle. Can be cut or spliced without seizing. Broken wires don't bristle. The rope is unusually well able to stand bending without premature fatigue.

Next time you buy wire rope—make it Purple Strand Form-Set. You'll be getting a combination of strength and flexibility that's hard to beat.

Today wire rope is the sinew of war production. For efficiency—use Purple Strand Form-Set.

PURPLE STRAND *FORM-SET* WIRE ROPE



BETHLEHEM STEEL

BETHLEHEM STEEL COMPANY

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ments on primary and secondary roads, particularly on projects where it can be spent with WPA participation.

An appropriation of $700,000 for retreatment of primary and secondary roads was divided among the 10 divisions on the basis of need.

Prince announced that the $3,000,000 improvement program would replace the highway department's normal new construction program, which has been dropped for the time being because of shortages of materials and the necessity of obtaining priorities. He pointed out that the Public Roads Administration has declined to approve any new construction except for access roads to defense centers.

Unless this policy is modified, Prince said, the highway department's present fund of $3,500,000 for new construction will remain unexpended. Of this amount, $1,800,000 was appropriated by the state and the rest by the federal government under the federal aid program.

NSGA and NCSA '42 Officers

Names of the 1942 officers elected at the annual conventions of the National Sand and Gravel Association and the National Crushed Stone Association in Cincinnati, Ohio, were not available at press time of our February issue and so we are publishing them at this time.

National Sand and Gravel's officials for 1942 are: Otto S. Conrades, St. Louis Material & Supply Company, St. Louis, Mo., president; H. S. Davison, J. K. Davison & Brothers, Pittsburgh, Pa., vice-president; and H. N. Snyder, Buffalo Slag Company, Buffalo, N. Y., secretary-treasurer.

National Crushed Stone's new officials are: W. M. Andrews, Union Limestone Co., New Castle, Pa., president; J. R. Boyd, administrative director; A. T. Goldbeck, engineering director; and W. E. Hilliard, New Haven Trap Rock Co., New Haven, Conn., treasurer. Regional vice presidents are: F. O. Earnshaw, Eastern; Paul M. Nauman, Midwestern; W. T. Ragland, Southeastern; W. C. Sparks, Central; A. J. Cayia, Northern; A. J. Wilson, Western; T. C. Cooke, New England; and W. F. Wise, Southwestern.

AIMME Forecast Greater Domestic Mining Activity

Discoveries of new resources and processes opening the way to vastly broadened domestic mining activity to aid in meeting the strategic metal needs of the war production program were revealed at the four day annual meeting of the American Institute of Mining and Metallurgical Engineers which concluded February 12 in New York City.

That large deposits of tungsten have recently been discovered in Idaho, Arizona, Utah, Nevada, Colorado and other sections of the United States was reported by E. H. Burdick, mining engineer and geologist of Salt Lake City; J. A. Mecia, geologist of the Bradley Mining Company, and Eldred D. Wilson, geologist of the Bureau of Mines and the University of Arizona.

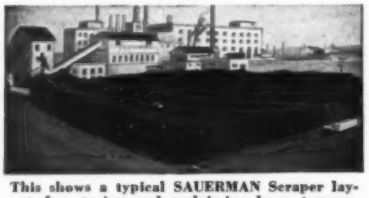
This discovery, the engineers said, promises to provide sufficient quantities of tungsten, although the cost of production would have to be stepped up about $5 per unit of 20 pounds, due to the inferiority of the American ore as compared with Asiatic ore from China and Burma.

Also reported to the meeting was the development of new processes by which metal usable in the manufacture of

Sauerman LONG RANGE MACHINES

A simple SAUERMAN Scraper machine stores and reclaims a seasonal surplus of 30,000 tons of screenings at crushing plant.

Here's another small SAUERMAN Scraper that moves sand from hill to asphalt plant at cost of 4 cents per cubic yard.



This shows a typical SAUERMAN Scraper layout for storing and reclaiming large tonnage of coal, or any bulk material.

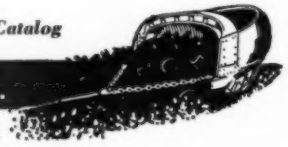
Dig, Haul, Dump
in one operation!

On jobs where materials are to be moved distances of several hundred feet or more, a SAUERMAN Drag Scraper or Cableway is a great money-saver because it will dig, haul and place the materials without the help of other equipment.

First cost of a SAUERMAN machine is reasonable, maintenance expense is light, and the simplicity of operation permits easy one-man control of even the largest installation.

Moreover this equipment is very flexible and is readily adapted to meet any new and difficult working conditions. Sizes range from small portable units designed for cheap handling of a small hourly tonnage of loose materials up to powerful machines that will move as much as 1,000 tons per hour of the toughest materials.

Write for Catalog



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"FILLING IN"
as well as "DIGGING OUT"

is often an important task assigned to a bucket.
The inherent ability of OWEN buckets to consistently obtain capacity grabs in all kinds of material, plus the rapid dumping action as a result of special shell curvatures, makes such a job as is pictured here literally "duck soup" for an Owen.

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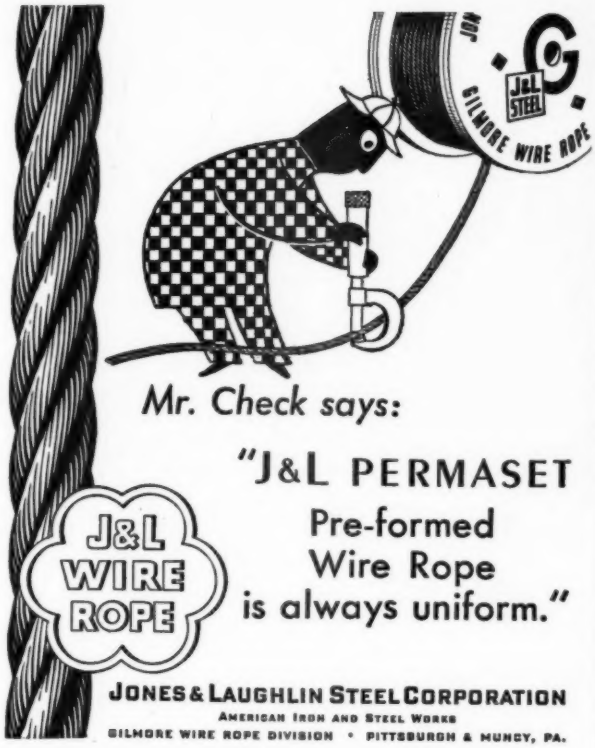

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A solid year on the rock pile!

Maintenance Cost . . . NOTHING

This THOR No. 75 Sinker Rock Drill worked every day except Sunday for one solid year drilling 24-foot deep holes (2-5/8" dia. starters, 1-1/8" finishers) in hard, abrasive sandstone with quartz seams. No repairs were required in the entire period.

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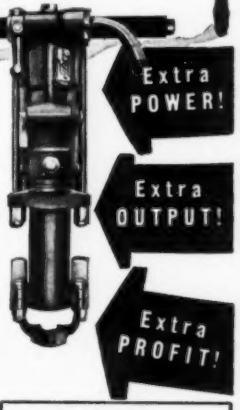

The Air Tools With The "Extras"

Dependable, low-cost performance is typical of THOR Rock Drills. And there is a THOR drill for every job of light, medium or heavy duty drilling. Ask your THOR Distributor how you can save time and cut costs with these better tools that cost no more.

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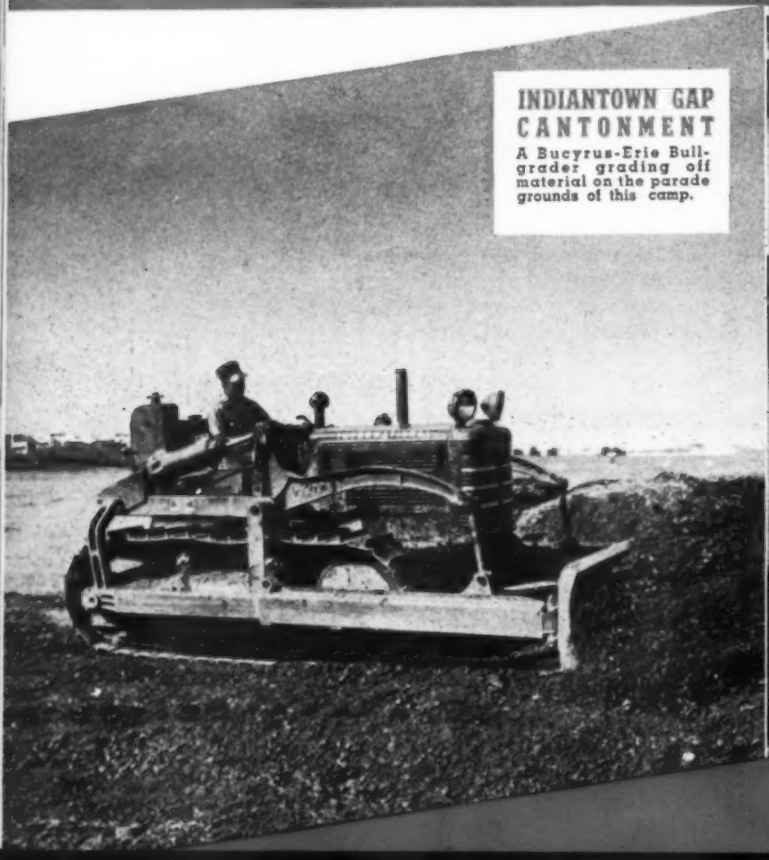
CITIES OVERNIGHT

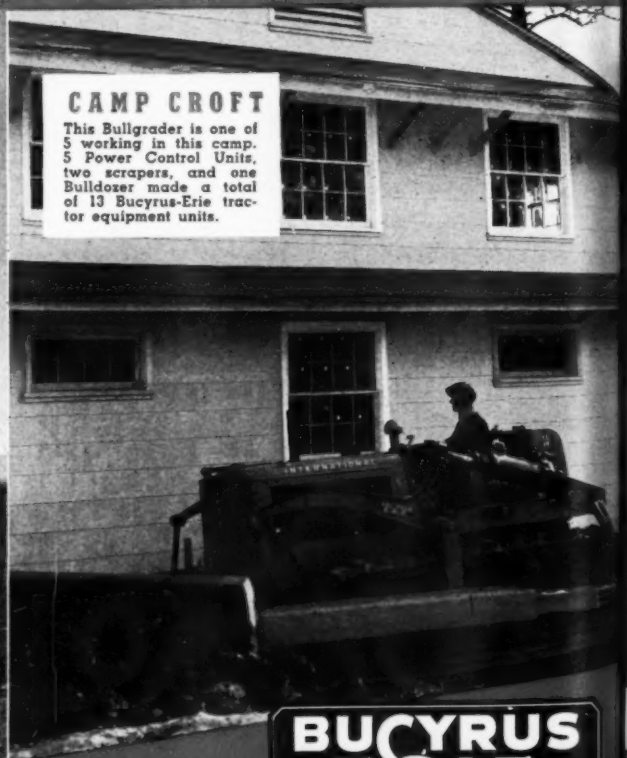
FORT KNOX

Part of the fleet of 7 Bucyrus-Erie 8-yard scrapers used on this project. There were also 11 Bulldozers, 5 Power Control Units, and 9 Tractor Cabs.



INDIANTOWN GAP CANTONMENT

A Bucyrus-Erie Bullgrader grading off material on the parade grounds of this camp.



CAMP CROFT

This Bullgrader is one of 5 working in this camp. 5 Power Control Units, two scrapers, and one Bulldozer made a total of 13 Bucyrus-Erie tractor equipment units.

BUCYRUS ERIE

DIRT had to roll — and roll fast — when these new Army Camps were erected. These big projects, most of them as large as good sized cities, had to be completed "overnight."

Ability to perform the seemingly impossible at top speed in the toughest going made Bucyrus-Erie Scrapers, Power Control Units, Bullgraders and Bulldozers favorites with the contractors, superintendents, and operators who used them in the camps, and resulted in Bucyrus-Erie fleets being constantly increased. Officials and engineers in charge found out, that when it comes to delivering under pressure, Bucyrus-Eries are tops both for speed and staying out of trouble.

It's Bucyrus-Erie Scrapers when it comes to short-distance loading, easy hauling, positive rolling ejection, and fast accurate spreading. It's Bucyrus-Erie Power Control Units when it comes to ease of operation, uninterrupted performance and rope economy. It's Bucyrus-Erie Bullgraders and Bulldozers when it comes to full tractive effort, easy handling, quick maneuvering. It's all of these units when it comes to staying on the job steadily 24 hours a day, week after week, without grief or need of shop repairs. Find out what the speed and enduring strength of Bucyrus-Erie Tractor Equipment can do for you in getting your rush war jobs done, and done ahead of time. — BUCYRUS-ERIE COMPANY, South Milwaukee, Wisconsin, U. S. A.

FORT BRAGG
Among the 12 Bucyrus-Erie tractor equipment units used here were: 5 Scrapers, 5 Power Control Units, 2 Bullgraders.

CAMP DAVIS
The seven Bucyrus-Erie Bullgraders at this camp were the handiest and busiest tools used on this muck-laden project.

CAMP GEORGE G. MEADE
A TD-18 Bullgrader doing some tough pioneer road building at this camp.

SEE YOUR
INTERNATIONAL TRACTRACTOR
DISTRIBUTOR

chromium and aluminum is extracted from ore found in formerly worthless domestic deposits.

Deposits located in the Far West are expected to yield a large supply to offset the shortage of chromium usually imported from the Philippines, Turkey and Southern Rhodesia. American engineers have been working for nine years on chromite ore found in a large deposit near Yellowstone Park, in the Stillwater region of Montana, and now believe that the new extracting method will furnish 80,000 tons a year of chromium, members of the U. S. Geological Survey and the Bureau of Mines told the meeting.

Alton Gabriel and John Dasher, of the Bureau of Mines, said that to augment the supply of bauxite, from which aluminum is produced, geologists have tapped the source of alunite deposits in five western states with considerable success. This source, it was said, may furnish the United States an additional three-year supply of 3,480,000 tons of aluminum.

The deposits are at Democrat Hill and Calico Peak, Col.; Cactus Range and Boyd, Nevada; Beaver and Marysville, Utah; Enumclaw, Wash., and Quartzite, Arizona. For many years, engineers were able to concentrate about 10 per cent of the alunite for manufacture of aluminum, but it was found too costly to utilize the remaining 90 per cent for the same purpose. The new process, however, now enables engineers to use all of the deposits, it was said.

Eugene McAuliffe was inducted as president of the institute at its annual banquet, succeeding John E. Suman. McAuliffe, who was elected last summer, is president of the Union Pacific Coal Co. and the Southern Wyoming Utilities Co., of Omaha.

Propose Alaskan Highway

The U. S. War Department's formal approval of a proposed $25,000,000 International Alaska Highway was expressed to the House Roads Committee in Washington February 6 through Col. James K. Tully of the general staff.

"The military and naval situation in the Pacific," the department said, "now indicates that a land route alternative to the existing sea routes is desirable from the viewpoint of national defense."

The committee had before it a measure, sponsored by Anthony J. Dimond, delegate from Alaska, to authorize the construction of a road through Northwestern Canada to link the Canadian and American routes with the Richardson Highway of Alaska.

The proposed highway has been a subject of cabinet discussions and there was said to be a belief within the cabinet, reportedly shared by President Roosevelt, that the project could be carried through by the chief executive even without congressional approval of legislation if the government of Canada approved.

• J. B. Stringfellow's ¾-yard Bucyrus-Erie shovel loads out some big ones near Riverside, California, with a wire rope sling.

Riprap Specialist

By Floyd Suter Bixby

Five miles west of Riverside, California, Contractor J. B. Stringfellow enjoys as near a "sure thing" as this troubled age can offer to a supplier of construction materials. For Stringfellow, who digs solid granite out of a mountainside to be used in the Los Angeles-Orange County flood control program, has only the usual problems of drilling, blasting, loading and hauling. Without meaning to be facetious, he reports that thus far there are no priorities in his part of the rock industry.

The quarry is the old Rohl-Connoly spread, set in the middle of a massive deposit of coarse grained porphyritic granite weighing about 157 pounds per cubic foot. The freshly broken rock is grayish blue in appearance, mottled by the dark flecks of porphry. In the abrasive Los Angeles rattler test, simulating rapid natural wear, the rock lost 28% of its volume where 40% was allowed. That's some indication of its toughness.

Stringfellow's operations began against the 42-foot face of huge blocks left by Rohl-Connoly. Four horizontal "coyote" holes were extended back 34 feet into the mass and loaded with ⅓ pound of 40% powder per estimated ton of rock. When the charge was set off a fair part of the 30,000 tons in his $120,000 contract rolled down or loosened up ready for use. Secondary shooting was necessary on the remainder to reduce it in size.

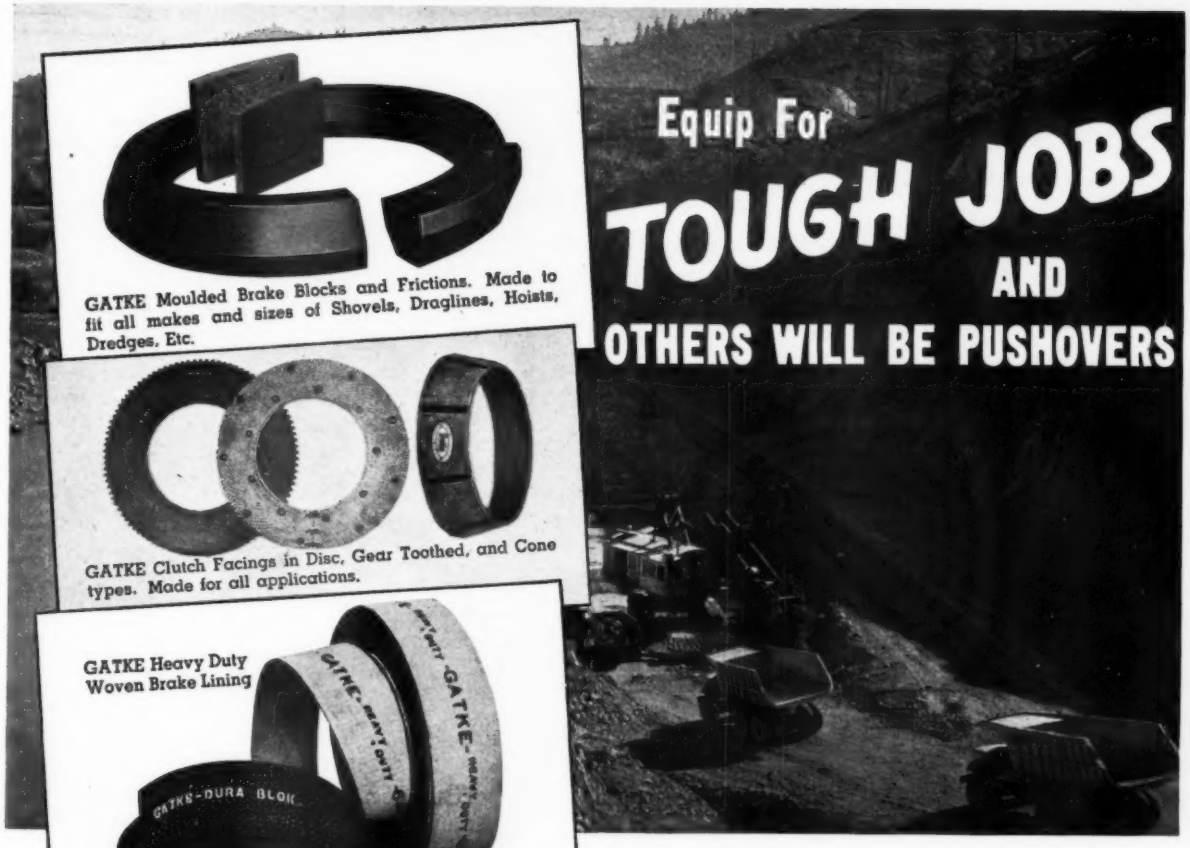
The paving stone, to be used on the upstream face of Brea Dam under a Winston Brothers contract, is loaded out in pieces weighing from 75 to 200 pounds. This stone is either gathered from the smaller pieces in the blasted pile, or some of the large chunks are drilled with short steel and split with rock gads.

The majority of stone under the Stringfellow contract is loaded out in pieces weighing from 500 pounds to eight tons. This derrick stone is used for scour protection wherever rushing water spills over concrete structures. Stone of this type has made up the larger part of this contractor's business during the past seven years. Imperial Dam, the Coachella Canal and Prado Dam being some of the more prominent consumers of this product.

There is about 350 feet of free loading area available at the base of the present rock supply. Large pieces are drilled and loaded while a rock shovel loads trucks somewhere else along the pile. Secondary shooting is done while the shovel is waiting for another truck. Stone thus broken can be picked over for larger sizes and paving stone loaded whenever that quantity appears.

In loading stone over a period of years Mr. Stringfellow has established something of a record in rock shovel operation. About 3½ years ago he purchased a new Bucyrus-Erie ¾ cubic yard machine, expecting it to be amply large to handle any rock his contracts demanded. It worked well. In loading out small rock the dipper was large enough to fill a truck bed in a hurry. In loading larger rock, and especially on jobs where a mixture of small stone was prohibited, the ¾ yard dipper placed clean, well graded loads in the trucks.

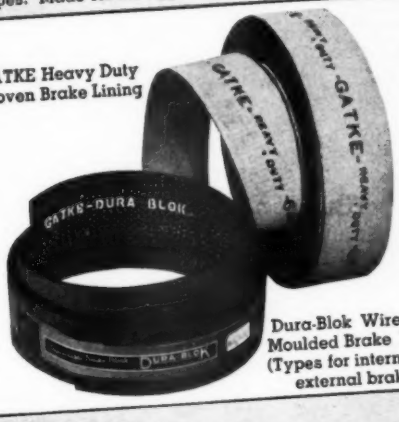
As the months went by, however, increased orders came in for larger stone. These orders, added to the usual routine



GATKE Moulded Brake Blocks and Frictions. Made to fit all makes and sizes of Shovels, Draglines, Hoists, Dredges, Etc.

GATKE Clutch Facings in Disc, Gear Toothed, and Cone types. Made for all applications.

GATKE Heavy Duty Woven Brake Lining



Dura-Blok Wire-Back Moulded Brake Lining (Types for internal and external brakes)

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Full Coverage Bolt-on Blocks

Bolt-on Type Brake Blocks

Full Coverage Rivet-on Blocks

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For ALL TRUCKS TRACTORS • TRAILERS and other equipment

HERE are the brake materials that stand the gaff on tough jobs wherever you find them.

GATKE High-Heat-Resisting Asbestos Brake Materials are made and service-proved for all kinds of brakes and clutches on all kinds of excavating, road building and construction equipment—LARGE or small.

Experience and knowledge acquired in more than 28 years of specialized development to meet operators' service requirements on tough jobs of all kinds go into the making.

Whatever your service GATKE has what it takes to do the job as it should be done.

We understand service requirements. Just tell us what you need.

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demand, were all sent in turn to the shovel operator. Since the purchase of a larger machine was not quite justified, the small shovel had to load heavy stone up to eight tons in size as well. How the machine has stood this punishment is worthy of mention.

The shovel has worked a total of approximately 14,000 hours, all in rock loading. Fifty per cent of this has been spent in the larger sized stones. In that 14,000 hours an estimated 350,000 tons has been moved. The shovel is still working 16 hours each day at the unusually low repair cost, after 14,000 hours, of ten cents per hour exclusive of labor. This cost includes all necessary mechanical repairs and motor overhaul.

Butane has been used for fuel in the shovel since it was purchased. The Bucyrus-Erie machine, the GMC and Chevrolet trucks are all serviced and fueled regularly by their operators as a part of their daily job.

Enlarge Jefferson Barracks

Jefferson Barracks, located 15 miles south of St. Louis, Missouri, has long been a station and training center for enlisted personnel of the U. S. Army's fighting force.

All of the land lying inside the reservation has undergone a thorough face lifting in fullfilment of a contract calling for better than a million yards of excavation and grading let early in 1941 to the Cameron-Joyce Company of Hannibal. J. T. Maloney, St. Louis, held the grading subcontract.

Earth to be graded was wet, heavy clay, soggy from ground water left behind the winter rains. Digging territory, too, was more or less restricted, for the trees inside the grounds had to be left intact insofar as possible. Excavating machinery, then, had to be effective in short distances and easily maneuverable.

Subcontractor Maloney brought in three International TD-18 TracTracTors fitted with Model P-24 Bucyrus-Erie power control winches. Two of the TD-18's were put to work towing Bucyrus-Erie S-90 scrapers, and the third machine was hooked on to an Adams 100 hauling scraper. All three machines began stripping grass and topsoil to get down into the yellow, sticky Missouri clay as quickly as possible.

Because the work was so nicely balanced between cut and fill quantities, it was easy to divide the whole job into a number of small excavation projects, keeping hauls down sometimes to 300 or 350 feet. Where the hauls could be kept between this distance and 500 feet, it was possible to dig about 1,200 cubic yards of earth per 8-hour shift with the three scrapers.

By skinning off 3½ inches of clay, the operators loaded good capacity loads

For your convenience in writing to the advertisers on this page, you will find a card bound in this issue.

into the scrapers in 125 feet. Taking a comparatively thin layer in this manner helped to get more actual dirt into each load, too, for it broke up into many small pieces upon entering the scraper bowl. The operators all conceded that this was the better method of loading. In addition to the riddance of voids between big chunks of clay they were thus making the job easier for the tractor and were getting away from a considerable amount of track slippage.

Subcontractor Maloney used another good common sense stunt in his scraper operations. It was noted that excavating operations always began near the tail end of his digging, making the initial hauls the longer. This was not as crazy as it first appeared. By doing this Mr. Maloney shrewdly used the top, firm soil for a haul road, and instead of having loaded tractors and scrapers lugging along through soggy ground in 3rd gear they were skimming along over firm roads in 5th. As soon as a 125-150 foot area approached grade, the scrapers moved up another loading distance. It worked well, for the cuts were seldom more than 7 feet deep.

A sheepsfoot roller towed by a Caterpillar RD-7 tractor was used for fill compaction. Heavily ballasted with water saturated sand, the roller kneaded the yellow clay in place. Courses were spread by the scrapers true enough to grade in most instances to permit the roller to work without further grading. Occasionally, however, it helped to drag an unloaded scraper across the top of the spread lift to get it perfectly smooth for the roller.

The WPA used a 2-yard Northwest dragline and several 5-yard dump trucks to move excavated dirt from the warehouse foundations. This agency also ran a railroad spur into the reservation from the main line of the Missouri Pacific railroad a few miles from camp. Several hundred feet of 12-inch tile pipe was laid in the ground to drain the acreage near the warehouses.

Nineteen States Change Size, Weight Limit Laws

Substantial progress toward uniformity of size and weight limits in harmony with the recommendations of organized highway officials was made during the 1941 legislative year when nineteen states changed their laws.

Particularly noteworthy was the removal of highway bottle-necks, caused by unduly restrictive limits, in Texas and Tennessee. The former Texas 7,000-pound load limit was abolished in favor of scientific standards using the formula of 700 (L plus 40) with a maximum gross of 38,000 pounds. The Tennessee gross weight limit was raised from 24,000 to 30,000 pounds.

Statutes providing new weight limits were also adopted in California, Florida, Georgia, Indiana, Iowa, Maryland, New Hampshire, North Dakota, Ohio, Oregon, Vermont and Washington. These laws generally use a maximum gross axle weight of 18,000 pounds as a standard. The so-called "bridge formula" of W equal X (L plus 40) is utilized in the new statutes in California, Georgia, Indiana, Maryland and Washington. The new Vermont law substitutes 600 pounds per inch of tire width in lieu of a 16,000-pound axle limit.

Revisions in maximum length limits were made in Arizona, Georgia, Indiana, Maryland, Massachusetts, North Dakota, Ohio and Wisconsin. Delaware increased the maximum height permitted to 12½ feet.

South Dakota law permits overlength and over-weight operations in order to furnish transportation facilities to communities where service has been abandoned by the railroads.

Increases in Illinois (H. 794, tractor semi-trailer lengths and H. 983, bus weights), Missouri (H. 116, bus weights) and Pennsylvania (H. 690, gross and axle weights) were passed by the legislatures but were vetoed by the governors.

Preformed Flattened Strand "HERCULES" Red-Strand WIRE ROPE

A Time and Material Saving Combination

There are three definite and outstanding factors that enable Preformed Flattened Strand "HERCULES" Red-Strand Wire Rope to help you speed up production and at the same time conserve needed raw material.

(1) As it is Preformed, it is easier and quicker to handle . . . it spools more smoothly and evenly . . . it offers greater resistance to fatigue.

(2) Due to the exclusive advantages of the Flattened Strand construction, it is stronger . . . more compact . . . and, because it has a larger and smoother surface, it is better able to resist wear.

(3) Being of the "HERCULES" grade, it is "tops" in quality and advanced manufacturing methods.

Why not utilize the advantages of this wire rope? Its longer life will not only save time and material — but money as well.

"HERCULES" Red-Strand Wire Rope is also made in all of the Standard Round Strand constructions — both Preformed and Non-Preformed. A "mis-fit" rope, either in type, construction, or quality, will definitely reduce efficiency. Our experienced Engineering Department will be glad to help you overcome this handicap.

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NOT in the *Contract*

The patter of tiny feet was heard from the head of the stairs. The proud mother raised her hand, warning the members of her bridge club to be silent.

"Hush," she said softly, "the children are going to deliver their good-night message. It always gives me a feeling of reverence to hear them. Listen!"

"Mama," came the message in a shrill whisper, "Willie found a bedbug."

"Thish match won't light."

"Washa madda with it?"

"I dunno—it lit all right a minute ago."

First student aviator (on first training flight): "Quick! What do I do now, instructor?"

Second student aviator: "Hell's bells, aren't you the instructor?"

The little old gray woman bent over the cherub in the cradle.

"O-o-o. You look so sweet, I could eat you."

Baby: "The hell you could, you haven't any teeth."

"Dull party, isn't it?"

"Yes, very."

"Let's go home."

"I can't. I'm host."

A traveler who believed himself to be the sole survivor of a shipwreck upon a cannibal island hid for three days in terror of his life. Driven out by hunger, he discovered a thin wisp of smoke rising from a clump of bushes, so he crawled carefully to study the type of savages about it. Just as he reached the clump he heard a voice say: "Why in hell did you play that card?" He dropped on his knees, and devoutly raising his hands, cried: "Thanks, God, they are Christians."

Traffic Cop: Use your noodle, lady! Use your noodle!

Lady: My goodness. Where is it? I've pushed and pulled everything in the car.

Cursing and yelling on a London street was Clancy holding a doorknob in his fist. "Them damn Nazis will pay for this—blowin' a saloon right out of me hand."

"I don't care if he can do the work of five men, you take him right back where you got him!"

What to Do in Case of an Air Raid

1. As soon as bombs start dropping, run like hell. (It doesn't matter where—as long as you run like hell.)
2. Take advantage of opportunities afforded you when air raid sirens sound the attack warning. For example:
   A. In a bakery, grab some pie, or cake, etc.
   B. If in a tavern, grab a bottle.
   C. If in a movie, grab a blonde.
3. If you find an unexploded bomb, always pick it up and shake it—the firing pin may be stuck.
4. If an incendiary bomb is found burning in a building throw water on it. You're unable to put it out anyhow, so you might just as well have a little fun.
5. Always get excited and holler bloody murder! It will add to the fun and confusion and scare the little kiddies.
6. Drink heavily, eat onions, limburger cheese, etc., before entering a crowded air raid shelter. This will make you very unpopular with the crowd in your immediate vicinity, eliminating any unnecessary discomfiture from people crowding too closely.
7. If you should be the victim of a direct bomb hit, don't go to pieces—lie still and you won't be noticed.
8. Knock the air raid wardens down if they start to tell you what to do. They always save the best seats for themselves and their friends anyway.

Science is resourceful. It could not open the pullman window so it air-conditioned the train.

Michael had taken a strong dislike to kindergarten. All persuasion failed, and finally his mother, in desperation, told him firmly that he would have to go. "All right, mother," retorted Michael. "If you want me to grow up into a damned bead stringer, I'll go."

A boy, attending Sunday school for the first time, was being catechized by his teacher.

"Now, where does God live?" asked the teacher.

"I think he lives in our bathroom," chirped the youngster.

"Why do you think that?" gasped the teacher.

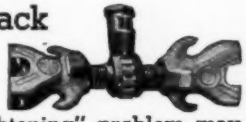
"Well, every morning daddy goes to the bathroom door and yells, "God! Are you still in there?"

MONEY SAVING BECO Accessories

Blocks and Linings

Beco Blocks and Linings take the heavy loads at the increased speeds demanded of modern excavating equipment. These Beco products are durable and tough — that's why replacements and adjustments are less frequent.

Push-Pull Jack



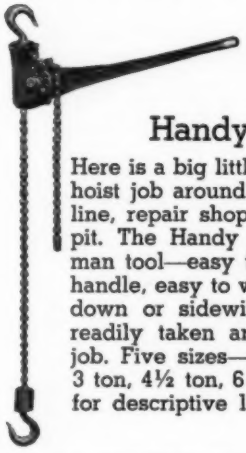
No matter how unusual your "push, pull, clamp, or straightening" problem may be, BECO Jack is the tool that gives you a safe, sure, and proved means of doing the job better. Screw lengths—10", 12", 14", 16" and 18". Capacity on nut ends 35,000 lbs. Send for bulletin.

Rock Grab

The Bucyrus-Erie Rock Grab lifts by compression, eliminating the necessity for previous preparation, no matter what the shape of the stone. Combines convenience, safety and savings. . . . Available in 2½, 5, 10, 15 and 20 ton capacity.

Rope Sockets

Bulldog wedge rope sockets never fail. The harder the pull . . . the tighter the grip! Attachment is easy and quick and directly in line with pull, eliminating costly kinks. Made in a dozen sizes and four different styles. Write for bulletin.



Handy Hoist

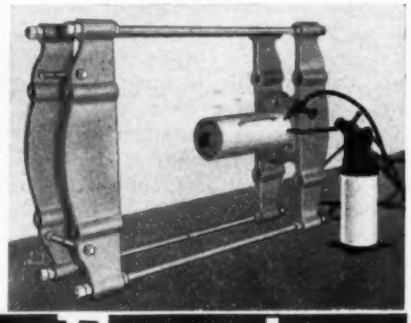
Here is a big little helper for any hoist job around shovel or dragline, repair shop, plant, mine or pit. The Handy Hoist is a one-man tool—easy to hang, easy to handle, easy to work. Pulls up or down or sidewise, and can be readily taken anywhere on the job. Five sizes—¾ ton, 1½ ton, 3 ton, 4½ ton, 6 to 15 ton. Write for descriptive literature.

Red Arch Chain

Red Arch incandescent butt-welded dragline chain has twice the strength and wearability of ordinary chain. It will save you extra money because of less shutdown time. You can get any size chain from ⅝" to 2" to fit your bucket. Write for complete story.

Hydraulic Press

For use as PULLER, PRESS or JACK to save you time and money in dismantling worn-out or broken-down equipment and in reassembling machine parts right in the field. Makes extra profits, too, on other types of lift, pull, or press work. Manufactured in 50, 100, 150 and 225 ton sizes.



Bucyrus-Erie

SOUTH MILWAUKEE, WISCONSIN

For your convenience in writing to Bucyrus-Erie Co., you will find a card bound in this issue.

• Occasional reluctant stumps were removed by hand grubbing. All brush was also chopped down and burned.

Kaiser-Gray

(*Continued from page 143*)

which did show up. The cut was taken up cleanly by cutting a 2½-inch layer and "boiling" it up into the scrapers. Gouging the scraper bowl is unnecessary in clay, Mr. Gray pointed out, for that practice picks up chunks which bulk badly. In addition, gouging is very destructive to control cables. Most of the Bucyrus-Erie scraper loads came out heaped above the strike off plates on the bowl. Occasionally, due to loading conditions, one not so good would come out, so the general average was about 9 cubic yards per load. This takes into consideration the tendency of the soil to bulk under loading action.

The same method of loading was used on the one Adams scraper, with similar results. It took an average time of 1.2 minutes and an average distance of 120 feet to load this scraper. While these are greater time and distance quantities compared to the S-90 scraper performance, it may be pointed out that the struck measure capacity of the Adams scraper is four tenths of a cubic yard greater; 10.4 yards against 10 yards for the S-90's.

Scraper Time Study

Because the hauling distance to the dump averaged about 390 feet after the scraper was loaded, it can be seen that the loading consumed about 11% of the complete cycle travel. It was easy to break this cycle down as follows:

CYCLE TIME, S-90 SCRAPERS

Average haul of 500 feet, level to 4% downgrade.

Loading, 1st gear	105 ft.	1.09 min.
Hauling, 4th gear (includ. dumping)	395 ft.	1.50 min.
Returning, high gear	500 ft.	1.19 min.
Allowance for turns		.50 min.
Total cycle time		4.28 min.

Cycles per 50 minute hour: 50/4.28: 11.7 round trips per hour.

In assuming a 50 minute hour, 10 minutes were deducted from the full 60 minutes to compensate for the lunch period, minor delays, servicing time and operator fatigue toward the end of the shift. Dumping time was included in the hauling time, since the easy dumping action of the Bucyrus-Erie scrapers made possible dumping without shifting gears. We multiply 9 yards by 11.7 round trips per hour, and the bare figures show 105.3 cubic yards, bank measure, hauled per hour. How does this check with actual field performance? It might amaze you!

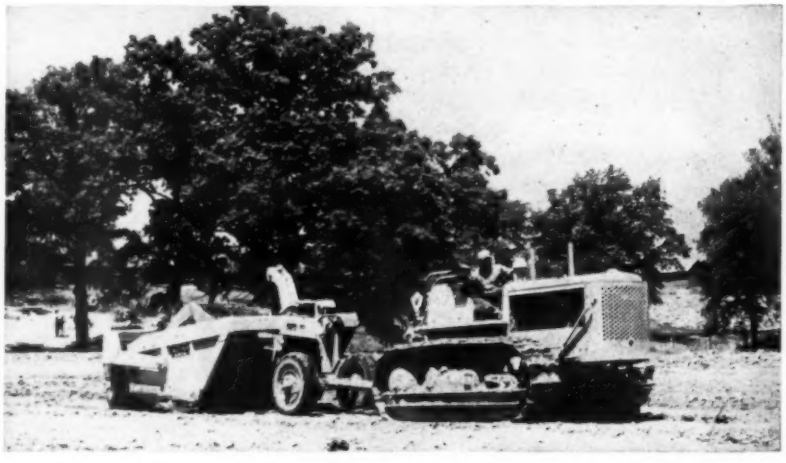
Before we ran this short time study, Mr. Gray "guessed that he was running close to 800 yards per shift per scraper." He based his guess on these facts: By actual survey cross sectional measurement, about 1,000 cubic yards per acre had to be moved. It took about 1¼ shifts, or 10 hours, for one scraper to dress up one acre. From the cold, practical standpoint, then, these two men with years of experience in dirt moving behind them knew that regardless of fancy figures they were running somewhere close to 100 cubic yards per hour. The figures said 105.3 yards. Wasn't that amazingly close?

Loaded scrapers were dumped in the low spots in long, shallow ribbons for two reasons. It was found to be easier to maintain a grade by dumping this way than by bunching the material in one spot. Better compaction was also secured in this manner since the layers compacted better under the action of rolling wheels than thicker courses would have done.

One of the main reasons why both parts of the job ran so smoothly and efficiently was the fact that Mr. Kaiser and Mr. Gray both acted as their own superintendents. It is well known that all the little wastes of time and energy and money all combine to make a big loss possible. By staying on the job with the machines both of these men were able to right the little things which occasionally need correcting on any job. It was a simple case of familiarity with their business, and knowing how to go about it.

Important things from the tractor operator's viewpoint were the surveyor's grade stakes. These stakes were set only one time by licensed engineers hired by Dimmit-Rickhoff-Bayer. If one was knocked out it had to be replaced

• A full load of Missouri clay, sliced off some high spot in the real estate development, rides to a fill area in one of the International powered Bucyrus-Erie S-90 scrapers.



at the expense of Kaiser and Gray. Since it was often necessary to work very close to the stakes, accurate control of the scraper was necessary. Each tractor was equipped with a Model P-24 Bucyrus-Erie power control unit. According to one of the operators this unit handled easily, smoothly, and did not tend to lose line pull efficiency.

So, there you have a "usual" job completed on schedule and at a profit by two contractors who know their men and machines.

Keeping Nation's Garden Green

(*Continued from page 141*)

draglines to the multi-bucket excavators which were the main digging tools and are now used principally for removing weeds from the canals. At the present time, the district has two Browning cranes and the following Bucyrus-Erie machines: one 29-B, one 21-B, three 20-B's, two 15-B's and two 10-B's. The district has a fleet of dump trucks and three special trucks and trailers which are used to move excavating machines to different parts of the district. Caterpillar RD7 tractors with LeTourneau bulldozers are used for trimming levees and for heavy towing.

Taken as a whole, the earth moving program of Mr. Hartzog's department is causing less concern at the present time than some other parts of the work. For the original digging of these canals and drains is only one operation. With modern machinery it is a comparatively simple operation. Maintaining the canals is another operation.

The chief problem right now is vegetation. A total of 3,000 miles of canal banks and drain channels in a semi-tropical country is bound to invite a heavy growth of vegetation. In the early days the district used a crew of from 20 to 30 Indians and Mexicans to cut out the vegetation by hand. That was costly work, and became more so as white labor replaced the native.

• Imperial Irrigation District's small suction dredge cleans out one of the larger canals. Silt is wasted to low ground where it will bolster the levee and eventually form productive land.

Killing Canal Vegetation

A major problem arose from the fact that bamboo and willow root systems grew stronger under the constant cutting. Since the canals carry water for drinking and domestic purposes, poison could not be applied to the vegetation. After much experimenting, the district designed two spray rigs, spraying a non-toxic solution of ¾ pound of sodium chlorate to a gallon of water on the annual growth of weeds and on the less hardy perennials. It took a full pound of chemical to a gallon of water to destroy the root systems of bamboo, and this had to be applied twice with two or three touch up sprayings after that.

Spraying was done by a 4-man crew. One of the spray units consisted of a 500 gallon tank and a pressure pump mounted on a trailer and towed by one of the district's Caterpillar RD7 tractors. The pump, powered by a 10 hp motor, supplied 15 gallons per minute under 500 pounds of pressure to the spray nozzles. This machine was used in the more inaccessible places. Where roads paralleled the levees, a similar rig mounted on a Dodge truck was used. Each of the machines spray about 9 miles of canal per day, depending on the density of growth.

Not comparable to this method as an exterminator, but one which has been developed greatly as a maintenance measure, is the practice of burning vegetation. In this work a 2 hp gasoline engine with a gear driven fuel pump is connected to a 50 gallon drum of fuel. Fifty feet of ½-inch hose with 20 feet of aluminum pipe fitted with orchard spray jets as the outlet end is used to do the actual burning. This whole arrangement is mounted on a tractor for transportation. A fire is started in the growth of vegetation and is then fed by spraying oil into the open flame and moving forward at a speed which will give the necessary degree of burning. Foliage is usually burned lightly the first trip, followed in from 10 to 20 days with a second burning which takes advantage of the additional fuel made by the dead leaves of the first searing. A perfectly clean job results from the second burning and unburned oil left on the ground tends to retard future growth.

Seven burning units are used, three mounted on trucks and four on tractors. About 1,000 gallons of light diesel oil per day is used per unit. Each machine will burn six miles of canal channel per 8 hour day.

Moss, favored by sunlight striking the canal bottoms through the clear water, has also become a great problem since the water began coming in free of silt. On drains where water can be shut off it is simple to dry up the moss in a day or two, but many of the smaller canals carry a constant supply of water. Some experimenting has been done by spraying oil into the canal bottoms, and at this time further attempts are

being made to check the spread of moss. According to Mr. Hartzog, it is not unusual for the moss to reduce the flow of water from 50 cfs to 10 cfs in a week.

Several new hydroelectric plants on the new Coachella canal will convert the 18,340 horsepower diesel generating plant at Brawley from a service plant into a standby unit. The district, among its other activities, generates a peak load of 6,000 kilowatts of electrical energy for use by residents of the valley. Incidentally, this Brawley plant is the largest diesel installation in the United States on the basis of installed horsepower in full service.

Some day, perhaps, there will no longer be problems to meet or battles to fight down in the Imperial Valley. But that will be a sad day. For there still lingers too much of that old pioneer spirit in the hearts of these people; the spirit that welcomes a good fight. The fertile miles of the valley are evidence that in the battle thus far, they've made a real showing.

MODERN WATER WELL DRILLS
IN the Bucyrus-Erie line of modern water well drills there is a size to fill every requirement — large or small. Whatever your needs, investigate Bucyrus-Erie drills first and see for yourself why they will reduce drilling costs.
Bucyrus-Erie Co.
SOUTH MILWAUKEE, WISCONSIN

Wm. Z. Williams

(Continued from page 148)

When I got your telegram, I was flat broke and I went out and pawned my watch and my ring and then looked up Mr. Ray again for some more stud poker. And this time the worm turned and I won five hundred and seventy dollars, which was all Mr. Ray had with him, and which proves he is not a card sharp. In fact, Mr. Ray is a plunger and when I made him the proposition I did, he wired to his banker in New York for more money and said he'd plunge with me and do most of the financing.

It's a swell idea, Mr. Itch. I got it from looking at the toy rigs Mr. Throttlebottom was installing in the casino at the fair. Listen, if people will pay a nickel to operate a toy what do you think they'd pay to make some passes with a real one?

Plenty, Mr. Itch. The machines you sent were taken off the train and set up on the fair grounds for our own version of Mr. Throttlebottom's racket. We operated all three yesterday, and did the biggest business of any concession on the fair grounds. People love to watch power shovels; you know that, Mr. Itch. And we did our best to keep them coming. First, to whet their curiosity, we built a large board fence around an area about half a city block square. Of course, we saw that there were plenty of peek holes in the fence. But we had them bored at various angles so it was impossible to see the entire show from any one hole. Then we got an old diesel engine which makes a terrible racket and set it up inside our enclosure to attract customers to our knot holes.

You know, Mr. Itch, how people love to watch shovels operate through cracks and holes in fences. When they found out, by means of some strategically placed signs, that they could actually run one of the clamshells for a small fee, they flocked to buy tickets. Before opening the concession, we dug three pits twelve feet square and four feet deep; had sand hauled from the seashore nearby and filled the pits with it. Then we put a clamshell at the edge of each pit and disconnected the propel so the customers couldn't move the machine.

Then I fixed stops so the rigs could swing only over the pit and turn clear around, and we were all set.

Here's how we work it. We let a customer take one scoop of sand for twenty-five cents. He fills the bucket and swings it over a wire screen, rigged at the side of each pit, and trips it. There are prizes of various unbreakable kinds in the sand, and if he's caught anything in his bucketfull, it's held by the screen and he gets to keep it. The sand goes on through the screen and runs back in chutes to the middle of the pit. In other words, it's just like the toy machines Mr. Throttlebottom operates, except that the clamshells are real and are simplified and made foolproof so anyone can fill the bucket and dump it on the screen.

From the time the fair opens until it closes in the evening, about fourteen hours a day, we have a line of people waiting at each rig. Each of the three takes in an average of about five dollars an hour with expenses limited to fuel, prizes and space rental. We missed the first day of the fair, but during the thirteen other days we'll clear plenty!

That is, we would except that Mr. Throttlebottom is buying us out. He's going to operate the idea with fairs and carnivals all over the country, and is paying us five thousand dollars flat for the idea and our concession here besides purchasing the three clamshells. So, it looks like we are going to come out with a nice profit for a few days' operation.

And I'm putting a clause in the contract that Mr. Throttlebottom agrees to use only D. Itch machines. Although I did agree verbally that we'd give him a better price in dozen lots. As soon as the fair here is over, he and I are going to take a plane to Circle Center to arrange with you about terms on the bigger orders. So I'll be seeing you, Mr. Itch.

Sincerely yours,
William

For your convenience in writing to Bucyrus-Erie Co., you will find a card bound in this issue.

Notes from the manufacturers

Bucyrus-Erie Company of South Milwaukee, Wisconsin, announces that the Missouri-Illinois Tractor & Equipment Co., Inc., has been appointed distributors for Bucyrus-Erie ⅜-yard to 2½-yard shovels, draglines, clamshell and lifting cranes. Their territory includes southwestern Illinois and eastern Missouri. The organization is also a distributor of Bucyrus-Erie tractor equipment.

Caterpillar Tractor Company, Peoria, Illinois, has been saddened by the sudden death of Thomas John Connor, 48 years old, vice president in charge of production and a member of the board of directors of the firm. Mr. Connor was born in Stockton, California, April 7, 1893 and was married to Zelia Swift, September 8, 1915. He was named general factory manager in 1930 and was advanced to vice president in charge of manufacturing in 1934.

The Cleveland Tractor Company, Cleveland, Ohio, mourns the passing of Edward M. Bell, Jr., vice president and treasurer, who died January 15, 1942, at Fort Lauderdale, Florida. Mr. Bell was born in Clarion, Pennsylvania, and became associated with the company in 1932. Mr. Bell was elected assistant treasurer in 1935 and vice president in 1939.

The B. F. Goodrich Company, Akron, Ohio, announces the appointment of John R. Hoover as manager of synthetic sales. Mr. Hoover succeeds Dr. H. E. Fritz, who was recently named director of research for the company. Mr. Hoover has been manager of rubber-lined equipment sales since 1935. The company also announces that former mechanical goods and sundries sales divisions have been combined and given a new name, the Industrial Products Division.

The Society of Automotive Engineers, New York City, has announced the election of A. W. Herrington as president of the group. Mr. Herrington is the head of the Marmon-Herrington Company, Indianapolis, Indiana.

The Harnischfeger Corporation of Milwaukee, announces the appointment of Mr. R. D. Holcomb as San Francisco district manager.

The Wellman Engineering Company, Cleveland, Ohio, has changed the location of its Chicago office to Room 1112, Merchandise Mart, 222 West, North Bank Drive, according to a recent announcement. Mr. John E. Carlson of the Williams Bucket Division of Wellman is in charge of Williams dragline and clamshell bucket sales and service at the branch office.

Westinghouse Electric and Manufacturing Company, East Pittsburgh, Pennsylvania, announces the election by the board of directors of L. H. Lund as treasurer. He succeeds L. W. Lyons who retired after 38 years' service with the company.

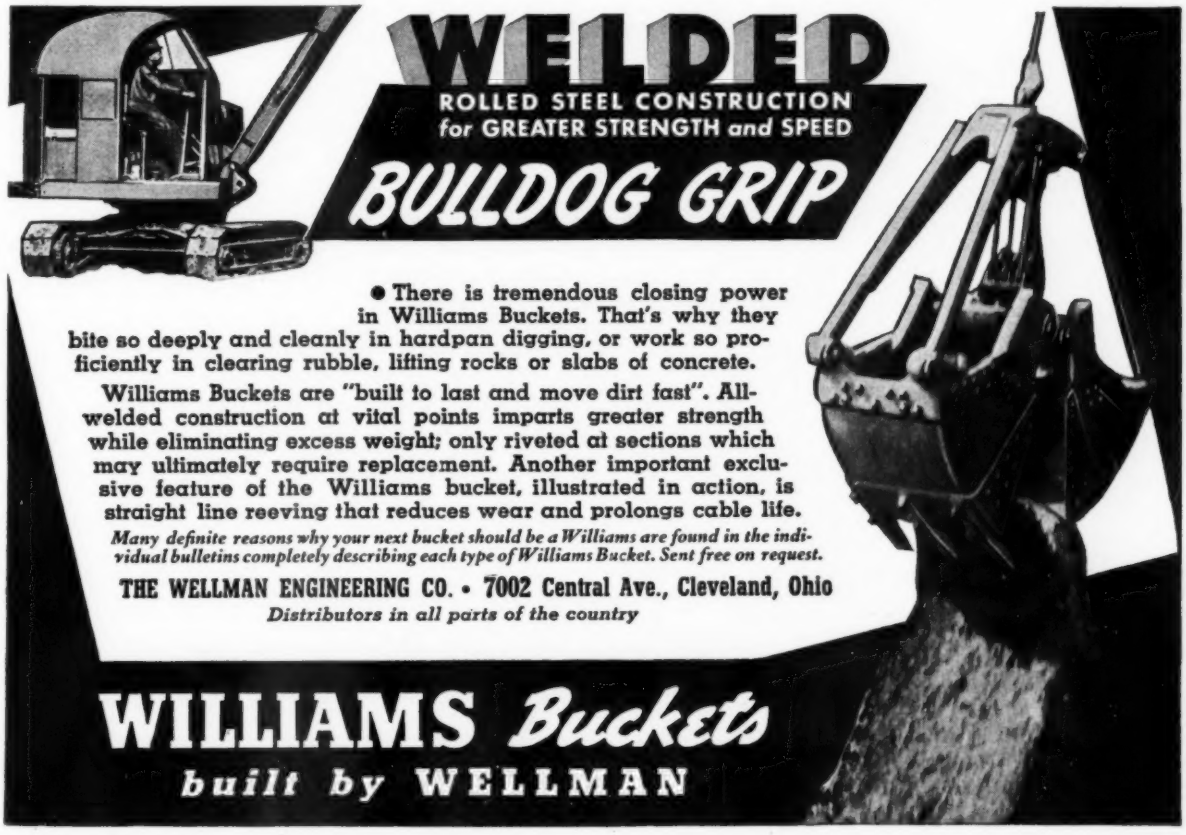
Help Wanted

Address all box numbers c/o EXCAVATING ENGINEER South Milwaukee, Wis.

Sales Engineer — Experienced in layout and estimating of conveying equipment as used by contractors in handling of sand, gravel and other materials. Sales experience desired. Barber-Greene Company, Aurora, Ill.

MACHINISTS

All-around machinists or machine operators—planer, Gisholt, turrett, lathe, boring mill hands. Heavy work. Operators must be able to set up own jobs; read blue prints. Write full particulars including age, references, number of dependents and how soon you can report for work. Men now working in vital defense industries need not apply. Box 9187


WELDED
ROLLED STEEL CONSTRUCTION
for GREATER STRENGTH and SPEED
BULLDOG GRIP
● There is tremendous closing power in Williams Buckets. That's why they bite so deeply and cleanly in hardpan digging, or work so proficiently in clearing rubble, lifting rocks or slabs of concrete.
Williams Buckets are "built to last and move dirt fast". All-welded construction at vital points imparts greater strength while eliminating excess weight; only riveted at sections which may ultimately require replacement. Another important exclusive feature of the Williams bucket, illustrated in action, is straight line reeving that reduces wear and prolongs cable life.
Many definite reasons why your next bucket should be a Williams are found in the individual bulletins completely describing each type of Williams Bucket. Sent free on request.
THE WELLMAN ENGINEERING CO. • 7002 Central Ave., Cleveland, Ohio
Distributors in all parts of the country
WILLIAMS Buckets
built by WELLMAN

For your convenience in writing to The Wellman Engineering Co., you will find a card bound in this issue.

New trade literature

Title: "Air Raid Shelters"

Subject: An 8-page circular describing a corrugated pipe raid-shelter made to accommodate up to 50 persons. A detailed drawing of the shelter is presented and a smaller family-type shelter is illustrated.

Where to Get: Armco Drainage Products Association, Middletown, Ohio. Free upon request.

Titles: "Tournacranes"—"Tournapass"

Subject: The bulletin, describing the new Tournacrane, is printed in two colors and is well-illustrated. Many applications of the versatile crane are shown.

The Tournapass, an outstanding development in traffic engineering is fully described in the other two-color, four-page bulletin. Photographs, time studies and car counts taken at a recent demonstration are featured in the booklet.

Where to Get: R. G. LeTourneau, Inc., Peoria, Illinois. Free upon request.

Title: "Here's How To Handle It"

Subject: A bulletin describing Rex belt conveying equipment and how it can be used to increase production. Large clear illustrations add interest to this modern booklet on material handling.

Where to Get: Chain Belt Company, Milwaukee, Wisconsin. Free upon request; ask for bulletin No. 41D.

Title: "Die List Number 18"

Subject: A 16-page catalog listing a wide range of sizes in Compo oil-retaining porous bronze bearings. The list, tabulating inside and outside dimensions, emphasizes the availability of variable lengths below and up to maximum length specified in each instance, with special dies. Also included are illustrations of self-aligning bearings and special shapes such as gears, sprockets and other unusual shapes.

Where to Get: Bound Brook Oil-less Bearing Company, Bound Brook, New Jersey. Free upon request.

Title: "Continuous Hollow Girder Concrete Bridges"

Subject: A 39-page booklet explaining design methods, procedure and problems of continuous hollow girder concrete bridges. Suggests concrete placement schedules and describes curing and removal of forms. This booklet is a sequel to a former publication "Continuous Concrete Bridges."

Where to Get: Portland Cement Association, 33 West Grand Ave., Chicago, Illinois. Free upon request.

Title: "Non-Metallic Bearing Catalog"

Subject: New booklet describes moulded fabric bearings of various types for grease or oil lubrication, water lubrication, acid resisting service, and some unlubricated applications. Large clear pictures illustrate bearings.

Where to Get: Gatke Corporation, 228 N. LaSalle Street, Chicago, Illinois. Free upon request.

Title: "Trade Standards - Compressed Air Industry"

Subject: A wealth of technical information concerning rotary compressors and vacuum pumps, centrifugal compressors and blowers, compressor accessories, rock drills and pneumatic tools. Data, tables and formulae are given on costs and uses of compressed air.

Where to Get: Compressed Air Institute, 90 West Street, New York, N. Y. Price $1.00.

Title: "Tire Handbook"

Subject: A valuable 96-page booklet on the care of many kinds of industrial tires. Gives safe loads, pressures, etc., through charts and rules, and tells how to get best wear.

Where to Get: B. F. Goodrich Company, Akron, Ohio. Free upon request.

Title: "Blackout"

Subject: In coastal areas and other locales where blackouts may be needed at any minute, this booklet will prove of value to those employed in all-out war work. The booklet describes, in simple language, the technique of light obscuration. The methods discussed in the study are not official regulations, but are procedures in which light can be obscured.

Where to Get: The Institute of Real Estate Management, National Association of Real Estate Boards, 22 West Monroe Street, Chicago, Illinois. Price 50 cents.

Title: "The Home Guard Training Manual"

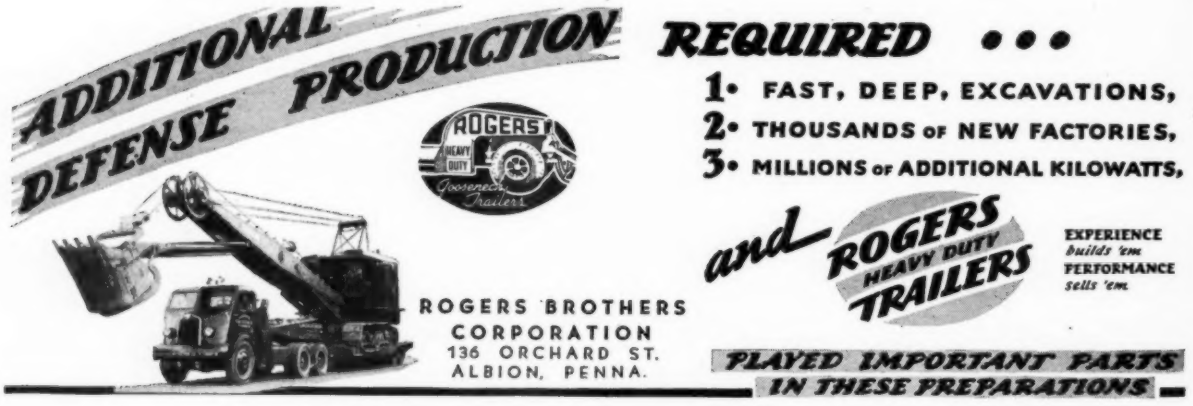
Subject: The first American edition of "Home Guard Training Manual" written in simple non-technical terms. All types of elementary auxiliary defense are explained. Exercises and questions concerning subjects discussed follow each chapter. Some of the points covered in the manual are; Object of the guard; organization; modified guerilla warfare; discussion of rifles and rifle shooting; hand grenades and their operation. Although this book was written mainly for British home defenders, the information presented will be of interest and value to every American.

Where to Get: Chemical Publishing Company, Inc., 234 King Street, Brooklyn, New York. Price $2.50.

Title: "American Highway Practice"

Subject: A comprehensive treatment of present rural highway survey, design, and construction practice in the U. S. The book presents current methods in cooperative road building by the several state highway departments and the Public Roads Administration on the federal-aid highway system. It is felt that both students and highway engineers need this book. Easily understood, the book is well-illustrated with photographs and drawings showing various highway construction methods.

Where to Get: John Wiley & Sons, Inc., New York City. Price $5.00.



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